

Antiquity

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Editorial Notes

IT is the business of ANTIQUITY to call attention to crying needs in the sphere of archaeology all over the world, and particularly in those still quite extensive regions which are under British government. One such need is the training of archaeologists to fill the posts of Directors of Archaeology (or whatever they may be called) in colonial countries. Such posts already exist in some and are likely to be created before long in others. We are thinking especially of the Sudan, Eritrea, Somaliland, Kenya and Nigeria. By reason of the long interlude of war it is by no means easy now to fill such appointments; the work demands some practical skill in many branches of archaeology—excavation, the conservation of buildings and other ancient monuments, the preservation of antiquities, the management of a museum and all that implies, photography and surveying.

We would suggest that the training of persons to fill such posts should be considered by those Universities which in fact do now supply most of the candidates. It is a task that can be accomplished better at a University than elsewhere; for although the qualifications (as we have said) are specific, premature specialization is a thing to be avoided at all costs. The general principles of archaeology can be learnt in any field; some of its greatest exponents (such as Petrie and Evans) did their first archaeological work in England before they went to the East. It is essential for the student to acquire a sense of archaeological values—that, for example, a coin picked up on the surface is inferior in value to one found in a stratified deposit. But one might go even further back, emphasizing the fact that 'new' countries are only new to us Europeans; they have had their own history which can only be discovered and recreated by digging and other archaeological techniques, which we can and should teach them. Readers may remember that in a recent number we published an illustration of a party of excavators in Central Asia (June, 1946, Plate II b, opp. p. 93). We selected this from amongst several others submitted because it shows that, under proper direction, primitive peoples can do archaeological work. Not all will respond of course, but some will, and they will become a nucleus for the training of others.

General principles are not easy to teach; they are learnt half unconsciously, chiefly from personal contact with the teacher. But once learnt they enable the archaeologist to cope with any situation anywhere. For instance, one of the duties of an official

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archaeologist abroad is the formulation, in concert with the other authorities, of antiquity regulations, and the granting of permission to excavate. If he has a firm grasp of first principles, he will insist upon the publication, within a short time of their conclusion, of a report on the excavations.

To sum up, those bodies which are concerned with the advancement of knowledge are responsible for the training and provision of students to fill certain posts that already exist. There is no sense in plaguing government departments to create new archaeological posts if we on our side cannot provide properly trained candidates even for those which already exist—and this applies to home appointments as well. The Government, on its side, has certain obligations to perform, and should set about its task in the proper way. Nothing is more surprising and regrettable than the complete absence of any clear-cut policy in archaeological administration abroad displayed by the British Government. The first essential move should of course be the appointment of a properly trained archaeologist to protect the ancient sites and monuments and to save from loss or destruction such remains as are unearthed from time to time. The first demands an adequate staff which must be trained and sent on tours of inspection; the second demands a museum where remains can be kept and exhibited. It is quite futile to appoint the archaeologist but deny him the tools to do his work, yet this is the usual procedure even in those rare cases where an archaeologist is appointed. In the whole of the British possessions in Africa mentioned above there is not a single properly equipped and endowed museum! The premises—that archaeology is important—are sometimes admitted; but the conclusion—that its raw material should be properly looked after and available for study—is always negated by failure to provide a museum.

The attitude of the British Government (which generally means some official in the Treasury or Colonial Office) towards archaeology (and we might add history as well) is ultimately determined by those seats of higher learning which educate its members; it is they who set the standards, and these in content are still those of the 18th century. That was a highly civilized period, but many avenues then closed have now opened up. Today in England a person may be regarded as well-educated though he is completely ignorant of the most elementary facts about the origins of man, of civilization, of writing, of the invention of the other useful arts or of the history of his native land before the arrival of Julius Caesar. His knowledge of geography, essential to any understanding of history, ancient or modern, is always rudimentary, and often defective over huge areas of the earth's surface (including those parts for whose welfare he is himself ultimately responsible). He may be completely ignorant of the causes which determine the weather (meteorology), the physical features of the landscape (geology), the evolution of life (palaeontology), the constitution of matter (physics and chemistry) or the structure of the universe (astronomy). By this ignorance (for which not he but his teachers are responsible) he loses much of the interest of life.

That this is not an exaggeration may be seen from what are called—we fear correctly—the 'weekly opinion-making journals', which devote a section to such things as the Arts, Entertainment and Book-reviews. No doubt the editors know

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their public and have to provide them with what they want ; it is not, then, the editors who are chiefly to blame, though we think they could do a lot more in the formation of opinion if they were not themselves usually as ignorant about many subjects as their readers are. To judge from the weekly culture-content of a journal such as the *New Statesman and Nation*, a large section of the intelligentsia is exclusively interested in pictures (especially modern ones), broadcasting, gramophone-records and the movies. From the nature of the book-reviews, and those selected for review, it would appear, that history and archaeology are subjects too difficult or too technical for their comprehension.



Things being as they are, we must not expect much improvement until the content of higher education is widened. But one has the impression that more might be done to widen the scope of the non-political parts of the weeklies, were they not in the hands of a narrow literary clique. Needless to say we are not attacking good literature, but merely complaining that much of what is itself (by comparison with some of the rubbish produced) good literature is ignored. It would be invidious to mention living authors, but of those no longer alive we would mention the writings of Haverfield, Macdonald and Collingwood. Everything written by them was a model of form and usually an addition to knowledge. It is a great mistake to suppose that scholars never write well or that 'literary men' always have some message to deliver to an anxious and expectant world. 'Literary men' write to make a living, and the more they write the more money they make. Scholars rarely make money by their books. But that which is done for love is generally better done than that which is done for money.



Or take museums. How much enthusiastic, underpaid work is done by museum-curators all over England ? But does one ever hear of it ? Not in the pages of the *New Statesman* at any rate ; and that journal professes to be interested in education. How much voluntary educational work of the highest order is done by overworked museum curators, taking parties of school-children round and explaining to them the meaning of the exhibits and how from them we can learn our own history ? In many years I cannot recall a single reference to all this mass of educational work that is going on (and went on during the war) day after day all over the country. It is of far more solid worth than most of the trash that poses as art and literature today. There has recently been some correspondence in the *New Statesman* about the plight of so called 'creative writers'. If they were any good at all they would write because they must, whatever their plight. What happens when the 'literary man' receives good payment may be gathered from an article in the *New Statesman* (19 April, 1947) on 'Books and Ballyhoo'.



You can sit down and write a poem or a novel with nothing but a pencil and paper ; but the scholar, the archaeologist and the historian need much more than this. They cannot work or write without books and museums, and to advance knowledge archaeologists must also excavate, and historians must have photostats of manuscripts. It is they who need money, not for themselves but in order that they may do their work at all. It is they and not these literary gents who need support.

The Intellectual Adventure of Ancient Man

Review Article by M. E. L. MALLOWAN

H. and H. A. Frankfort, J. A. Wilson, T. Jacobsen, W. A. Irwin: *The Intellectual Adventure of Ancient Man*. 1946. University of Chicago Press. 4 dollars. Agent: Cambridge University Press, London.

IT is a pity that Hume, who carried the Cartesian system of philosophy to its logical conclusion, lived too early to contemplate the discoveries of the past century in Egypt and Babylonia, for he would readily have understood and assimilated the ancient processes of thought which arose at the dawn of history in Western Asia—‘And no truth appears to me more evident’, he said, ‘than that beasts are endowed with thought and reason as well as man’. The arguments are developed in section xvi of ‘The Understanding’, where there are many delightful passages of special relevance to the ancient concepts about life. Again, he said that a bird, that ‘chooses with such care and nicety the place and materials of the nest, and sits upon her eggs for a due time, and in a suitable season, with all the precaution that a chymist is capable of in the most delicate projection, furnishes us with a lively instance of animal sagacity’. Locke, on the other hand, in his discussion of *animal rationale*, had refused to be drawn so far. ‘And if Balaam’s ass had, all his life, discussed as rationally as he did once with his master, I doubt yet whether any one would have thought him worthy the name “man”, or allowed him to be of the same species with himself’. Of these two statements Hume’s approximates more closely to the earliest Asiatic view of life, and it is on these lines that Messrs. Frankfort, Wilson, and Jacobsen have approached their problem, which, briefly put is—how did the early thinkers of the Near East come to say what they did about creation, the state, and man? Professor and Mrs Frankfort define the earliest mode of thought as an ‘I-thou’ relationship, by which they mean that the primitive Asiatic conceived of all creation in a reciprocal nexus wherein the material world was percipient as well as perceived, and Professor Wilson elaborates the same theme by saying that for the Egyptians the world was consubstantial, and that their view of life might be defined as monophysite. Professor Jacobsen’s contribution illustrates to what extent the Mesopotamian view of life conformed with this outlook, for example how salt and grain were conceived of as animate beings in a close relationship with man, responsible and responsive to him. Other ideas peculiar to the Mesopotamian mind are no less clearly stressed, and herein lies the fascination of the book, that we have a comparative examination of the Egyptian, Mesopotamian and Israelite approach to life, for Hebrew theology was cast out of a similar matrix. In a concluding chapter by the Frankforts, we see the dawn of a new intellectual era. The Greek physical philosophers, regardless of the data of experience, carried the old basic concepts of the Egyptians and Mesopotamians from a concrete to an abstract frame and worked them to a *reductio ad absurdum*, much as Hume did for the concepts of Cartesian philosophy. Their prescience gave birth to science. Nor should we forget that Thales of Miletus prophesied an eclipse, thereby following in the wake of the Babylonian astronomers, who had made similar observations and recorded them centuries earlier.

I do not intend to spoil this book for the reader by quoting or recording what the authors themselves have expressed so well, and indeed, to do full justice to their material one would have to write another volume. I think a sympathetic Frenchman would say

that all these chapters are 'passionant', for the theme itself is a novel and entertaining experiment. Here we have, as it were, five 'stars' who have combined as a team to try out and play out a new tactical game. It was not to be expected that so distinguished a cast could succeed in producing a perfect unity, but the writing as a whole is unusually lucid, sometimes brilliant, there are many words of wisdom spoken and some enthralling new Egyptian and Mesopotamian texts are made available in translation for the first time.

I was however disappointed to find that Professor Irwin had made no attempt to discuss the significance of the ancient Canaanite literature of Ugarit, for here surely some place should have been found to discuss the Bull El, and the agricultural passion-play, centring around the figures of Baal, Aliyan, Mot and Anat. Some statement was also needed on what can now be accepted and what rejected as unsound from these texts. And there is a marked neglect too of much recent evidence concerning the incorporation of Mesopotamian law within the body of the Old Testament. Professor Irwin indeed stands out as a conspicuous sinner, because he has gone his own way, and concerned himself least of all with the central theme, which should have given unity to the book. Much will be forgiven him, however, if only for having spread before us an anthology of Hebrew poetry.

I have already indicated that the novelty of treatment is a discussion of the special relationship between man and nature in the earliest Egyptian and Mesopotamian myths. Another way of putting the argument, perhaps, would be to suggest that these primitive processes of mythological thought were comparable to the working of the child mind, and personally I have found that listening to the imaginative inventions of a boy aged four has been far more instructive than reading many of the learned theoretical discussions on the subject of mythology. For we can only understand myth by entering into the state of mind which makes myths, which is indeed imagination, based primarily on the association of ideas.

One night, not long ago, I watched the birth of a myth from the mind of a small boy, who was frightened at the sound of a fog-horn which had penetrated through the mist of the Bristol Channel to his bedroom. He was told that this was the noise of a fog-horn, kindly, not harmful. None the less, a few nights later, when it was still foggy, he awoke terrified from a nightmare, saying that Mr Fox had entered his bedroom. What was the connexion? The answer is that he had previously listened to some tales about a fox, and that in his dream, the fox and the fog-horn had become associated. Fox and fog had become confused by assimilation of sounds, and Mr Fox was now an evil genius, a source of fear. But the boy had not played out his story yet. Later on Mr Fox gradually became a beneficent being; by a process of wishful thinking, he ceased to be a subject of taboo, was freely discussed, and became a constant playmate. This kind of fancy, as far as I can see, is just how myth begins and may develop. All sorts of confusion creep in, the powers of evil can become powers of good, and yet fear usually remains latent and is always liable to emerge. The alternation of Osiris as sometimes a good, and sometimes an evil deity is an ancient illustration of this psychological process. And therefore I agree with Messrs Frankfort and Wilson that modern rationalistic criticism which would account for apparently conflicting stories by attributing to the Egyptians an inability to think clearly, approaches the task from an entirely erroneous standpoint. Apparently irreconcilable stories which to the rationalistic mind would have seemed incompatible needed no reconciliation in the myth-making mind. Such stories took their place within a myth cycle in the easy sequence engendered by a long familiar association of ideas. That, however, does not mean that we are unable to learn much from an analytical examination of individual myths, for all imaginative

experience is based on something real, some concrete experience against a finite background. Hence the Creation stories of Mesopotamia, Egypt, and the Hebrews are, in spite of many basic similarities, differentiated by the special character of a varying landscape, climate, and economy. What these particular conditions were and what strange myths arose out of them the reader will discover from the 'Intellectual Adventure of Ancient Man'.

Anyone who reflects about the characteristics of these early peoples will form his own personal impressions, which are bound to be only a partial experience of the truth, but none the less are the only means of extracting some coherence from what would otherwise remain an undigested accumulation of purely factual knowledge. I therefore make no apology for selecting certain aspects of Asiatic life which have silhouetted themselves in my mind. The Egyptians strike me as a carnal people, unable to tear themselves away from the wrappings of the flesh which they so readily mummified. They were wishful thinkers too, and continually compounding with death, which was to them a kind of impertinence. Their attitude sometimes reminds me of the sentiments expressed by an eighteenth century English parson, who said of the Elizabethan aristocrat, Sir John Gilbert, that he was taken off by death—'that inveterate enemy to great worth'.

One of the secrets of ancient Egyptian continuity lay in their natural genius for administration. The maxims of their wise men stated in effect as a cardinal principle that it was an offence to go over the head of your immediate magistrate, that a good judge, in order to discern the true from the false looked behind the evidence, and that an aggrieved party must be allowed to blow off steam. I can think of no better advice to give any administrative officer engaged in Civil Affairs. Again, the Egyptians, even when thinking abstractly, tended to express themselves in concrete terms and had a pictorial way of thought, which makes many of their myths and much of their theology very difficult to memorise, except through pictures. That pictorial view gave their mode of thought a unity and a survival value, which was not seriously undermined until the age in which the Greeks began defining their intellectual view of life.

The reader will judge for himself how far the basic ideas of the Hermopolite, the Heliopolite, and the Memphite theologies were shared by thinkers in other parts of the Asiatic world, and how much the physical philosophers of Greece in the sixth century B.C. based the starting points of their philosophies on these ancient Oriental concepts. It is evident that the early Asiatics had in concrete form speculated about earth, air, fire and water, not to mention numbers, for many millennia before the Ionian philosophies of Anaximander, Thales, Anaximenes, Heraclitus, Pythagoras and Parmenides were formulated into systems. Hereon Professor and Mrs Frankfort have written an entrancing chapter, which reveals for us the shadowy borderland between the closed theological realms of Egypt and Babylonia on the one hand, and classical Greece on the other. In these Ionians we see the dawn of metaphysics, and in relation to what had come before and what was to follow I think of their predecessors as in a state of 'ὄναρ', and themselves in a state of 'ὑπναρ', that half-consciousness between sleeping and waking which precedes the true awakening. It is only right that the book should close with a passage from the *Timaeus* in praise of philosophy.

It would however be entirely wrong to conclude that the systems of thought preceding the Greek had been exclusively theological. In the Memphite system it seems to me that the Egyptians had gone to the extreme limit of speculative thought of which they were capable within the peculiar pictorial mechanism which conditioned their outlook. Professor Wilson does not fail to draw a parallel between the concept of Ptah as the divine order engendered by heart and tongue and the 'logos' of St. John the Divine.

When we compare the Egyptian and Mesopotamian modes of thought we find many radical differences in outlook to the cosmos. Professor Jacobsen has worked out an interesting parallel between the ordering of the Mesopotamian cosmos and city state, and the feudal system of the Manor, while Professor and Mrs Frankfort have pointed to a number of distinctive peculiarities in the creation myths. The basic approach to nature however was fundamentally similar, for it was in the same system of child psychology which the authors define as the 'I-thou' relationship.

We have seen that a study of Egyptian civilization leaves on the mind a predominant impression of continuity—a continuity personified by the Pharaoh, who, unlike Mesopotamian monarchs, was begotten of God. Between Tigris and Euphrates life was perhaps less secure, there were greater variations of climate than on the Nile, and the country was easier of infiltration from foreign peoples. Rarely was the country unified for long successive periods as it was in Egypt. Political stability in Mesopotamia was almost entirely dependent on the personal activity and vigour of individual monarchs, and the historical records show that each succeeding monarch had to win for himself anew and consolidate whatever territorial conquests his predecessors had achieved. And yet the significance of recent archaeological discoveries in Mesopotamia is that it draws vivid attention to the remarkable unity of culture, which persisted over a great part of the valley, in spite of centuries of violent political upheaval. Mesopotamian man, if we may refer to him thus, was perhaps conscious in his myths of greater conflicts in life, which was more of a struggle with the unseen and uncertain forces of nature. Water from the underworld was no less important than water from the rivers, and this may explain the worship of Ea, personified in the Apsu, which was the divine well. In Mesopotamia man was created as a servant of the Gods, whereas in Egypt we have more often the impression that the Gods were there to serve man. This is an interesting reflection of two radically different casts of mind. The Egyptian, as I have said before, was more of a wishful thinker, the Mesopotamian was ever conscious that life was not ordered for his benefit. He had little or nothing to hope from the next world, which was dark and dank, where men ate mud and drank ditch-water and feathered spirits hovered in the gloom. The Egyptian, on the other hand, in the course of time, saw to it that he should share with the Pharaohs in the privileges of the after-life.

Both in Egypt and in Mesopotamia there was a constant preoccupation with the ritual, a ritual of pageantry and festivals for every important season in the calendar. And this fact, I think, is a clue to another psychological mode in the make-up of these early peoples. The persons who ran the state were actors in a series of constantly recurring dramas. Now the psychology of the actor has a special significance, for the actor is engrossed in being the subject or person he represents, and it is not his business to reflect on the nature of the subject he represents. The actor *qua* actor is an entirely amoral being; what matters to him is the identification of himself with another being and the mechanism by which that identity may be assumed. Changes of dress, symbolic regalia, posture, are of supreme importance. It seems that acting is one of the most absorbing and engrossing of human pursuits, and I believe that the prolonged continuation of festival ritual in the ancient East was in part due to the fact that the most important persons or castes in the state, year after year, took part in play-acting ceremonial and enacted the sacred cosmic dramas at recurring periods in the calendar. The authors of this book have frequently drawn attention to the importance of naming a divinity or assuming a divine name, and that was on a par with becoming a God, a hero, or a demon in the ritual ceremony. And I therefore believe it to be no accident that moral philosophy and a preoccupation with ethics is a comparatively late development in ancient culture.

For that stage could only be reached when those taking part in the play began reflecting objectively about the subjects of their activity. It is true that as early as the third millennium B.C. Egyptian maxims already concerned themselves with fair dealing for the humbler members of society, and the poor peasant is already an object of commiseration, but the ethical view of life was only fully developed for the first time with the advent of Christianity. If we realise that early man was an actor before God, we are some way towards understanding the tempo of his mental development.

Another point of interest in our view of ancient man as an actor in a passion play or cosmic drama is that an ambitious actor might reform the play by making his own the star part, much as in the modern pantomime Cinderella, the once insignificant 'Buttons' has now become one of the principal characters. Similar changes in the mythological protagonists frequently occurred. Marduk, stealing the part of Enlil on the Babylonian stage is partly, but not wholly, analogous.

The Hebrew view of life, to which Professor Irwin has devoted much learning and a genuine love of his theme, marks a tremendous step forward from the older Mesopotamian and Egyptian concepts. The love of humanity, which oversteps the limits of national boundaries is indeed a new mode of thought.

' My heart turns within me ;
All my tenderness is kindled '

said the prophet Hosea, and it is remarkable that a chosen people, so conscious of their ethnic unity, was none the less able at times to comprehend a God that loved all mankind, and had compassion for Ethiopians, Philistines and Ninevites. It is surprising that Professor Irwin, who has quoted many fine passages from Amos, Hosea, and Jonah on this subject should have omitted to discuss the remarkable views of the prophet who wrote Isaiah XL to LV. On this subject the reader should consult Dr Sidney Smith's Schweich Lecture (1940) where we have what is to my mind a convincing demonstration that an Israelite prophet was advocating the acceptance of a Persian monarch—Cyrus—as the Lord's anointed, a King, who was to bring salvation to Zion, and re-establish Israel in Jerusalem. That episode in Israelite history illustrates another aspect of the shrewd political set up in the Hebrew world where the priesthood was so often the power behind the throne. At a time when there was no longer a Hebrew monarch, a far-seeing prophet realized that a foreign ruler could become no less powerful a substitute to ensure the stability of Israel.

Throughout the Old Testament again we have a far greater insistence on the virtues of a good life, and right action as pleasing to God than ever before. But right action was largely obedience to divine precepts and observance of divine law. This is what is enjoined by Wisdom in the Proverbs. And here I disagree entirely with Professor Irwin's suggestion that the Wisdom of the Proverbs was parallel to the Platonic theory of Wisdom ; for I assume that the suggestion is that the Wisdom of Proverbs was in some sense the equivalent of ' *νοῦς* '. In my opinion the two concepts were poles apart, because the Wisdom of Plato, as described in the sixth book of ' The Republic ' was a purely abstract faculty, concerned with the contemplation of Ideas. Wisdom in the Proverbs was largely concerned with the observance of moral, legal and religious precept. To argue that Hebrew thought in this respect marked a notable supremacy over Platonic is a misapplication of the Platonic theory. Plato's Republic was not for philosophers only : they were to be the ruling class, and true though it may be that this is not practical politics, Plato's thought was a noble aspiration towards a better ordering of human affairs. To draw a detrimental picture of the Platonic state in comparison with that of the Hebrew on the grounds that Plato would only have had a place of menial service for

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the simple and foolish is a no less erroneous appreciation of the Platonic position. One of the main themes in Plato's Republic is the definition of Justice, which is 'τα αὐτοῦ πράττειν', 'minding one's own business', by which it is meant that every individual in a state has his own proper function, the soldier—war, the merchant—trade, the guardians—morals, the farmer—agriculture, and so forth. One does not enhance the acknowledged worth of Hebrew thought by making false comparison with that of the Greeks. No less unacceptable to me is Irwin's tilting at Herodotus, one of the world's great historians, who, in a manner unsurpassed, guides our footsteps from the Caspian to the Fezzan. Every year that I have travelled in the East has for me added something to his stature.

Here the restrictions of space fortunately compel me to cease putting down the impressions which have passed through my mind on reading this book. We owe a debt of gratitude to each and all of the contributors. No one who is interested in ancient speculative thought can afford to neglect it, for it abounds in wisdom, knowledge, and the fruit of recent discovery.

Sheep and Swine in the Husbandry of Prehistoric Europe*

by GRAHAME CLARK

SINCE the classic work of Rütimeyer (1) and others on the fauna of the Swiss lake-villages was first undertaken nearly a century ago, a vast amount of information has been assembled about the livestock of the prehistoric farmers of north-western and central Europe. Interest at first centred on distinguishing breeds of the various species in the hope of defining the routes by which farming spread from its early homelands into the European continent. In recent years more attention has been paid to the light which can be thrown on the economy of prehistoric communities through a study of their livestock: among the chief points which it has been sought to establish are the age at which various species were normally slaughtered, the relative proportions of wild and domestic forms and the proportions in which the different species of livestock were maintained by the people under investigation.

In the present article it is proposed to concentrate on the last aspect and to consider the relative positions of pigs and sheep at different stages of European husbandry in prehistoric times.

Before embarking on any discussion, one should emphasize the uneven quality of the sources. This is due in part to the varying extent to which animal remains survive in different areas, in part to the restricted sampling due to the small size of most archaeological excavations and in part to defective analysis of the material obtained. Indeed, it is only exceptionally that the remains of domesticated animals have been recovered in sufficient quantities or studied in sufficient detail to inform us adequately even about the composition of the livestock maintained by different communities. Yet, if the evidence is defective, it is consistent enough to sustain some discussion of the causes underlying certain changes in the flocks and herds of prehistoric man.

The most suitable point of departure is the familiar material from the chalk downs of Sussex and Wessex, since we have here faunal assemblages from numerous sites, ranging in age from Neolithic to Romano-British, within a geologically homogeneous zone. We have, also, the benefit of an acute and enlightening observation by Prof. D. M. S. Watson, F.R.S., who, in reporting on animal remains from the Neolithic and Early Iron Age ditches at the Trundle, Goodwood, Sussex, noted that whereas traces of swine were 'relatively abundant' and those of sheep 'much rarer' from the earlier occupation, from the later they were 'markedly less abundant than sheep' (2). From

* I am indebted to Dr H. Godwin, Prof. V. G. Childe and Dr C. Elton, for having read this paper in typescript. While concurring with its general thesis, they have offered valuable criticism on various points.

¹ L. Rütimeyer, *Die Fauna der Pfahlbauten der Schweiz*. Zürich, 1862.

² *Sussex Arch. Coll.*, LXXII, 148-9.

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this, combined with evidence from other sites (3), it may be deduced that between Neolithic and Early Iron Age times there was a substantial decline in the pig and a corresponding increase in the sheep population of the chalk downs; cattle, it may be noted, remained the most important element and the small Celtic pony was added by the Iron Age. The position in Romano-British times can be summarized most easily by means of a table (4), based on the excavations by General Pitt-Rivers on Cranborne Chase (5):

	Woodyates	Rotherley	Woodcuts
	per cent	per cent	per cent
Ox	37	33	39
Sheep	33	40	29
Pig	2	3	13
Horse	26	18	10
Dog	2	4	6
Wild	(trace)	1	3
Specimens identified	3669	3606	4204

It will be noted that, despite some deviations at Woodcuts, the fauna from the three sites agrees substantially: sheep form a main and at Rotherley the chief element in the fauna; domesticated horses of the small Celtic pony type are well represented; and swine are insignificant at Woodyates and Rotherley and markedly inferior to sheep even at Woodcuts.

The contrast in the relative importance of sheep and swine on the chalk downs during Neolithic and Early Iron Age times respectively is well attested. What is more difficult to establish, owing to the dearth of settlement material, is precisely at what stage of the

³ *Neolithic*: Cattle were the chief source of meat at Whitehawk Camp, Brighton, swine were second and sheep and goats comparatively uncommon (*Sussex Arch. Coll.*, LXXI, 82). Although detailed evidence has yet to be published for Windmill Hill, nr. Avebury, Prof. Watson states that the same applied to this site (*ibid*). Dr Wilfrid Jackson found 'little to be said' about remains of sheep from the Neolithic locations at Maiden Castle, Dorset, 'except to remark on their scarcity' (*Maiden Castle Report*, 364).

Similar evidence is forthcoming from sacred sites of the 'henge' class. Only a few traces of sheep occurred at Woodhenge (M. E. Cunington, *Woodhenge*, 69) and none at all from the West Kennet Avenue, Avebury (*Antiquity*, 1936, II) or the Sanctuary on Overton Hill (*Wilts. Arch. Mag.*, XLV, 330-1).

Early Iron Age: Remains of sheep occur in substantially larger, those of pig in smaller proportions: at All Cannings Cross, Wilts., sheep ranked next to ox and remains of pig were 'not very numerous' (M. E. Cunington, *All Cannings Cross*, 43-50); similar results were obtained at Fifield Bavant and Swallowcliffe Down in the same county (*Wilts. Arch. Mag.*, XLII, 492-3; XLIII, 190-3) and at Meon Hill and Quarley Hill in Hampshire (*Proc. Hants. F.C. and A.S.*, XII, pt. 2, 156-7). Identifications were made by Dr Wilfred Jackson whose work in this field has been indefatigable.

⁴ Occurrences of the various species are shown as percentages of the total number of identifiable specimens from each site.

⁵ *Excavations in Bokerly and Wansdyke, Dorset and Wilts.*, III, 233.

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Bronze Age the change-over occurred. Indications from the ditches of rectangular enclosures on the Dorset Downs (6) point to the process having been well advanced already during the Late Bronze Age.

	<i>Ox</i>	<i>Sheep</i>	<i>Pig</i>	<i>Horse</i>	<i>Goat</i>	<i>Total</i>
Handley Down ..	33	6	—	4	—	43
Martin Down ..	153'	20 (7 jaws)	14 (2 jaws)	6	1	194
South Lodge ..	104	33+	—	—	—	137
Total specimens ..	290	59+	14	10	1	374
Percentages ..	77.5	15.8+	3.7	2.6	0.3	—

Swine are completely absent from similar enclosures on the Wiltshire Downs (7), where sheep were present in perceptible numbers, though subordinate to cattle. Evidence from miscellaneous settlement sites from the same period in southern Britain also points in this direction (8).

Before discussing the causes for the rise in the sheep population and the decline of swine on the downlands of southern Britain, it is worth enquiring whether we have to deal with a phenomenon of continental or merely insular significance. The fauna from the Swiss lake-villages provides one obvious check. Thanks to modern stratigraphical work the archaeological material and animal remains from successive levels has been isolated, so that it is now possible to compare evidence from different stages of the Neolithic period with that from Late Bronze and Early Iron Age levels. So far as the early and middle Neolithic stages are concerned, one may tabulate results obtained during the earlier excavations at Port-Conty (9), St. Aubin, Auvèrnièr, on the shore of Lake Neuchâtel, and at the bog of Wauwyl, kt. Luzern (10).

⁶ *Excavations on Cranbourne Chase*, IV, 39-41, 134-5, 208-14.

⁷ Similar enclosures at Ogbourne West and on Boscombe Down, Wilts., have yielded further evidence for a great predominance of cattle, reflecting no doubt their function, a number of sheep, but no swine (*Proc. Prehist. Soc.*, 1942, 54-9; *Wilts. Arch. Mag.*, XLVII, 484-6).

⁸ e.g., At Thorney Down, Wilts., sheep were represented by limb bones, teeth, jaws and part of a horn-core, pig by a single tooth only (*Wilts. Arch. Mag.*, XLVII, 659). At Minnis Bay, Kent, ox and sheep were each represented by three jaw bones and other remains, but pig was absent (*Proc. Prehist. Soc.* 1943, 41 f.). The proportions between sheep and pig were more evenly balanced at Mildenhall Fen, but here local conditions were of rather a special character (*Ant. J.*, XVI, 33-4).

⁹ L. Reverdin, 'La faune néolithique de la station de St.-Aubin (Port-Conty, lac de Neuchâtel)', *Archives suisses de l'Anthropologie générale*, t. IV, 1920-2, 251-4. Material from a second campaign (L. Reverdin, 'Sur la faune du néolithique ancien et moyen des stations lacustres', *ibid.*, t. V, 1928-31, 41-6) showed a higher proportion of sheep and goats, which, however, were not separated; if, the ratio between the two was constant, the figures for sheep from the early and middle levels respectively from both campaigns at Port-Conty come to c. 5.7 and 8.9 per cent, as against 42.9 and 41.7 per cent for oxen and 21.7 and 36.7 per cent for swine.

¹⁰ K. Hescheler, 'Beitrag zur kenntnis der Pfahlbaufauna des Neolithikums (Die Fauna der Pfahlbauten im Wauwylersee)', *Vierteljahrs. Naturf. Ges. Zürich*, Jhg., LXV, 1920, 248-322.

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	<i>Port-Conty</i>				<i>Wauwyl</i>	
	Early Neolithic		Middle Neolithic		Middle Neolithic	
	Min. no. of individuals	per cent	Min. no. of individuals	per cent	Min. no. of individuals	per cent
Ox	75	50	20	44	33	42
Sheep	6	4	4	9	4	5
Pig	28	18	16	36	30	38
Goat	10	7	2	4	8	10
Dog	32	21	3	7	3	4
	151		45		78	

It will be noted that, while cattle were most strongly represented, pig was easily second, sheep being relatively insignificant and horse entirely absent. Reinert accurately summarized the position in 1926, when he wrote (11) that cattle and swine formed the mainstay of the livestock of the earliest farmers of the Alpine area and that sheep and goats, although present from the beginning of Neolithic times, played a relatively smaller role. Subsequent work by Kuhn on Neolithic sites in the canton of Zürich, although based on restricted material, helps to confirm this impression (12).

	<i>Ossingen, Hausersee (13)</i>	<i>Obermeilen (14)</i>
	per cent	per cent
Ox	58	40
Sheep and Goat	—	14
Pig	36	31
Dog	6	15
Minimum no. of individuals ..	36	52

¹¹ H. Reinert, *Die jüngere Steinzeit der Schweiz*. Augsburg, 1926, s. 41-2.

¹² K. Hescheler and J. Rueger have published results from the Luzern area, which at first sight appear anomalous, in their 'Die Wirbeltierreste aus dem neolithischen Pfahlbaudorf Egolzwil 2 (Wauwilensee) nach den grabungen von 1932 bis 1934', *Vierteljahrsschrift d. Naturf. Ges. Zürich*, Jhg. 84, 1939, 307-30. Out of at least 355 domesticated animals 142 were oxen, 95 pig and as many as 86 or 24 per cent sheep and goats, the remaining 32 comprising dog. On the other hand, wild animals outnumbered domesticated ones by nearly two to one and the species were exclusively forest forms, not a single horse or hare being represented among 692 individuals. Again, it is notable, in view of the lack of clear demarcation between wild and domesticated forms in early times, that 65 wild oxen and 68 wild pig were represented. It will be seen that sheep and goats together comprise only a slight element in the fauna as a whole.

¹³ E. Kuhn, 'Beiträge zur Kenntnis der Säugetierfauna der Schweiz seit dem Neolithikum', *Rev. suisse de zoologie*, t. 39, 1932, no. 18, 531-768.

¹⁴ E. Kuhn, 'Die Fauna des Pfahlbaues Obermeilen am Zürichsee', *Vierteljahrsschrift Naturf. Ges. in Zürich*, LXXX, 1935, 241-330.

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A very different picture is given by remains of domestic animals from lake-dwellings of the Late Bronze Age. Already in 1883 Studer (15) had contrasted the position of sheep in the Neolithic and Late Bronze Age stations of the Bielersee in western Switzerland: whereas, at Schaffis, sheep and goats were subservient to swine and cattle, at Morigen the position was reversed and sheep were predominant, a change which, it is interesting to note, Studer associated with the greater importance of agriculture in the later period. More recently Hescheler compared the abundant domesticated fauna from the Late Bronze Age site of Zürich-Alpenquai with that from Wauwyl and noted the rise of the sheep, which together with goat now accounts for a full third of the livestock, and the appearance of domesticated horse in the shape of the small Celtic pony (16).

Although the evidence from Denmark and Sweden shows important differences, it confirms the relatively late appearance of sheep and domesticated horse as major elements in the fauna. So far as the Stone Age coast-dwellers are concerned, the most notable feature, as Menghin observed (17), was the predominating importance of swine. This is well brought out by comparing the numbers of shoulder-blades for the various species from kitchen-middens of Neolithic age from Jutland (18).

	<i>Aalborg</i> (<i>Signalbakken</i>)	<i>Leire Aa</i>	<i>Ørum Aa</i>	Totals	
Ox	8	2	6	16	per cent 11.5
Pig	79	10	17	106	76.3
Sheep	9	—	8	17	12.2
Total numbers of shoulder-blades	96	12	31	139	

It will be noted that swine accounted for more than three-quarters of the livestock, cattle and sheep for about one eighth each. Swine were also predominant among the domesticated and semi-domesticated animals from the Sub-neolithic coastal dwelling-places of Gotland:

	<i>Visby (19)</i>	<i>Hemmor (20)</i>	<i>Västerbjers (21)</i>
Ox	30 (10.9 per cent)	—	54 (3.9 per cent)
Pig	241 (87.3 ")	4582 (100 per cent)	1262 (91.9 ")
Sheep/goat	5 (1.8 ")	—	57 (4.2 ")
Number of specimens ..	276	4582	1373

¹⁵ Th. Studer, 'Die Thierwelt in den Pfahlbauten des Bielersee's', *Mith. der Naturf. Ges. in Bern*, II h., Abh. 17-115. 1883. s.113-4.

¹⁶ K. Hescheler, 'Die Tierwelt der schweizerischen Pfahlbauten', *Pfahlbauten Zehnter Bericht*, 1924, 98-108. s.105. Out of a total of 5432 specimens, 10 per cent related to wild animals 29 per cent belonged to oxen, 23 per cent to domesticated pig, 30 per cent to sheep and goat, 4 per cent to horse and 5 per cent to dog.

¹⁷ O. Menghin, *Weltgeschichte der Steinzeit*, 274. Vienna, 1931.

¹⁸ A. P. Madsen *et al.*, *Affaldsdynger fra Stenålder i Danmark*, 145-6, 158-61, 172. Copenhagen, 1900. ¹⁹ J. Nihlén, *Gotlands Stenåldersboplatser*, 192. Stockholm, 1927. ²⁰ *ibid.*

²¹ M. Stenberger *et al.*, *Das Grabfeld von Västerbjers auf Gotland*, 107. Stockholm, 1943.

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To emphasize the point, it may be added that pig bones accounted for 86 per cent of the entire faunal assemblage from Hemmor and 72.6 per cent of that from Västernbjers. For a discussion of the status of the swine from the Gotland sites the reader is referred to Pira's treatment of the pig bones from Stora Förvar on Stora Karlsö, which yielded remains of individuals representing every stage from wild to stunted, domesticated forms; it is evident that, especially among Sub-neolithic communities on the margin of the farming area, even the tame pigs obtained most of their food in the woods and must have inter-bred with wild ones (22). Similar low-grade swine-keeping seems also to have been characteristic of the dwelling-place people of south Sweden (23).

Among the megalithic farmers of Denmark, on the other hand, swine shared the predominance among livestock with cattle. At the 'dolmen'-period settlement of Havnelev on Zealand (24) ox bones were in the majority, pig being represented in considerable (*ret betydelig*) and sheep in unspecified numbers. The excavations at Troldebjerg, Blandebjerg and Lindö on Langeland I, dating respectively from stages I, II and IV of the Danish passage-grave period, each revealed a predominance of cattle and swine, with sheep in a subsidiary role (25). Only at Bundsö on Aals, dating from stage III, were sheep represented in substantial numbers, although even here stated to be third in abundance to pig and ox (26).

Evidence for the composition of Danish livestock during the Bronze Age is meagre, but Herluf Winge has published the results of his examination of faunal remains from a number of sites from the latter part of the period (27). In the following table the proportions, in which the various domestic animals, other than dogs, occurred on the three main sites, are summarized in terms of the numbers of rearmost molars from lower jaws:

					<i>Voldtofte</i>	<i>Hasmark</i>	<i>Bulbjerg</i>
Ox	..	..	..	..	lower 126 upper n.d.	6	5
Pig	..	..	..	..	lower 42 upper 23	2	1 (frag.)
Sheep/goat	..	..	..	..	lower 31 upper n.d.	5	7
Horse	..	..	..	..	lower 14 upper 31	7	1

The most obvious feature is the appearance of the horse as an important element in the domestic livestock, but there is some interest in the number of sheep: at Hasmark sheep were second only to oxen and at Bulbjerg they were actually first; on the other hand, at Voldtofte, the only site to yield a really substantial body of evidence, cattle were

²² A. Pira, 'Studien zur Geschichte der Schweinerassen, insbesondere derjenigen Schwedens', *Zoologische Jahrbücher*, Suppl. 10, 233-426. Jena, 1909.

²³ J. E. Forssander, *Medd. fr. Lunds univ. hist. mus. Lund*, 1941, 148.

²⁴ T. Mathiassen, 'Havnelev-Strandegaarde', *Aarbøger*, 1940, 17.

²⁵ J. Winther, *Troldebjerg*, 46. Rudköbing, 1935; *Blandebjerg*, 25. Rudköbing, 1943; *Lindö*, 38 and 48. Rudköbing, 1928.

²⁶ T. Mathiassen *et al.*, 'Bundsö', *Aarbøger*, 1939, 143.

²⁷ H. Winge, 'Dyrekogler fra Bronzealders Boplads', *Aarbøger*, 1919, 93-101.

overwhelmingly predominant, although sheep may well have been as numerous as swine (28).

Cattle were also easily predominant in the large assemblage of animal bones from Veileby, Laaland, dating from the Roman Iron Age and amounting to some 30,000 pieces (29); on the other hand, there are signs that sheep played an important part, at any rate locally. Although Prof. G. Hatt's excavations in the Iron Age villages associated with 'Celtic fields' in parts of north Jutland have yielded no very large quantity of animal remains, he found clear evidence for cattle and sheep and very little for pig-keeping. Thus, the meat-bones found in a pot in a house of the pre-Roman Iron Age settlement at Skorbaek were exclusively those of beef and mutton (30); numerous ox and sheep bones were found at the Roman Iron Age settlement of Engelstrup (31), together with a few rare pig bones, a single goat bone and, significantly, the metacarpal of a hare; and at Malle Degnegård the fauna comprised sheep and cattle, with a few remains of horse (32). Another sign of the importance of sheep during the Iron Age is furnished by the results of Winge's determination (33) of animal bones from cinerary urns: in every instance the remains, which included eleven lots from the Roman Iron Age and twelve from the Migration Period, proved to be those of sheep.

To sum up, it appears that the subservience of sheep and goats to cattle and swine among the livestock of the earliest farmers of the south of England was in fact only a local manifestation of a much more widespread phenomenon. As regards the relative proportions of cattle and swine important regional differences can be noted, cattle being as a rule predominant in the western culture area, whether in southern England or in the lowest levels of the Swiss lake-settlements, swine in the northern, more particularly among coastal dwelling-place groups; but the relatively minor importance of sheep and goats was a feature common to all.

There is also some evidence that the emergence of sheep as a factor of greater importance during the Late Bronze and Early Iron Ages was widespread, although by no means invariable. Full allowance must be made for cultural and geographical patterns, which must have played as important a part in determining the composition of the livestock maintained in any area as they do to-day. The fauna from the Lausitz settlement on the Schlossberge, near Burg on the Spree, for instance, comprised: (34)

	Minimum no. of individuals	per cent		Minimum no. of individuals	per cent
Ox	31	21	Red deer ..	10	7
Pig	56	37	Roe deer ..	5	3
Sheep	28	12	Wild pig ..	5	3
Goat	4	4	Elk	2	1
Horse	5	3	Urus	1	1

²⁸ It is a pity that no details are available about the number of upper jaws of sheep; the number of lower jaws is only one less than half the total number of pig jaws.

²⁹ *Aarbøger*, 1906, 219-20.

³⁰ G. Hatt, 'Jernalders Boplads i Himmerland', *Aarbøger*, 1938, 119-266, p. 152.

³¹ *ibid.*, 237. ³² *ibid.*, 254. ³³ *Aarbøger*, 1900, 166-182.

³⁴ J. U. Duerst, 'Die Tierwelt der Ansiedelungen am Schlossberg zu Burg an der Spree', *Arch. f. Anthr. N.F.* II, 1904.

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The fact that the foliaceous Spreewald continued to shelter herds of swine during the Late Bronze Age in no wise alters the fact that in many widely separated areas, where in Neolithic times they had been relatively inconspicuous, sheep rose to importance during this period and during the Iron Age even attained local predominance.

In seeking to account for the restricted role of sheep-breeding in Neolithic husbandry and for its rise to importance later in prehistoric times, one is confronted with ecological factors which transcend the influence of individual, communal or even cultural predilection. Since livestock depend for their existence on plant food, it can be assumed that, before the introduction of fodder crops in comparatively modern times, an intimate relationship must always have existed between the composition of flocks and herds and the character of the vegetation prevailing in and around the area of settlement. This in turn must have been the product of interaction between such factors as soil and climate and the effects of human activities like forest clearance, cultivation of the soil and the grazing of livestock. It follows that livestock ought to be considered in the light of contemporary vegetation and that explanations for alterations in the proportions in which different animals were maintained should first to be sought in changes in plant ecology.

One may begin by pointing out that the type of vegetation most congenial to cattle and swine under primitive conditions differs from that favoured by sheep. Just as the aurochs and the wild pig were essentially forest animals, so their domesticated forms continued down to modern times to depend to a large extent upon woodland resources. The association between swine-herding and certain types of foliaceous forest has been reflected in historical records since classical times (35) and is well known to have formed one of the principal bases of Anglo-Saxon economy. The number of swine which a given area of woodland was capable of carrying was commonly noted in pre-Conquest charters and formed one of the stock entries in Domesday. Indeed, historians have not hesitated to measure the progress of deforestation between the conquest and the survey in terms of the diminution in pannage between the two dates (36).

Although not linked with woodland in the narrow sense that swine were in early times, oxen nevertheless benefited from the leaves and branches of foliaceous trees, notably of the elm and the lime, for winter fodder, and this applied with especial force to the period before hay-making was developed during the Early Iron Age (37). The practice of feeding leaves and branches to cattle was well-known to the ancients (38) and undoubtedly reached back into prehistoric times. Lopping-knives of a type used for gathering the leaf harvest certainly go back to the pre-Roman Iron Age in parts of Scandinavia (39) and some authors interpret as such the pressure-flaked flint 'saws'

³⁵ e.g. Strabo (5.1.12) noted that Rome was largely supplied with pork raised on the acorns of the forest of Cisalpine Gaul.

³⁶ J. H. Round first used this method for parts of north-west Essex, by comparing the numbers of swine maintained in the woods between 1066 and 1086 (*V. C. H. Essex*, I, 333, 1903). More recently, Dr H. C. Darby has made similar calculations for the counties of Essex, Norfolk and Suffolk (*ANTIQUITY*, 1934, 211-5).

³⁷ A. W. Brögger, 'From the Stone Age to the Motor Age', *ANTIQUITY*, 1940, 163-81: see p. 172. cf. E. E. Evans, *Irish Heritage*. Dundalk, 1942, 95-8.

³⁸ Thus Varro wrote that 'cattle are best pastured in clearings where there are shrubs and leaves in abundance' (*Rerum rusticarum*, bk. II, cap. v, 11) and Columella specified the best kinds for feeding to cattle in summer, namely elm, ash and poplar (*De re rustica*, VI, 3, 6).

³⁹ A. W. Brögger, *op. cit.*, 1940, pl. I.

of lunate form dating from the ending of the Stone Age (40). During the summer, also, in parts of Scandinavia cattle are still turned loose in leafy meadows, artificial and more open versions of the former forest glades. It may be that Strabo (41) was referring to something in the nature of the Norwegian *saetter* when he wrote of the Britons that

'Forests are their cities, for having enclosed an ample space with felled trees, they make themselves huts therein, and lodge their cattle, though not for any long continuance'.

The relationship of sheep and goats to forest was very different. Describing the wild forebears of the domestic sheep, Lydekker wrote that, although preferring open country to the rugged and often precipitous ground favoured by their close relative, the goat, they are 'essentially mountain-animals', which 'shun forest, and feed entirely by grazing, or by nibbling the shoots of herbaceous plants' (42). As for domesticated sheep, it is well-known that these flourish on moorland and hill-country and not least on the downlands of southern England on which they first became abundant towards the end of prehistoric times. The contrast ought not to be overdrawn, since, just as cattle adapted themselves to open pastures when these became available, so did sheep avail themselves of foliage in a forest habitat; indeed in marginal areas both cattle and sheep even adapted themselves to a diet of sea-weed in times of dearth. Still, it remains true that, by and large, sheep would have found a forested landscape less congenial than either oxen or pigs.

Now, it was into just such a landscape that the Neolithic farmers spread, bringing to north-western Europe a knowledge of crops and livestock. Application of the technique of pollen-analysis in particular has shown that by Atlantic times the area of colonization was extensively covered with woodland, which on the plains and on the lower slopes was foliaceous in character. The mixed oak forests were extraordinarily favourable to husbandry of a primitive kind (43), not only affording scope for extensive agriculture associated with burning and felling, but also providing sustenance for livestock. In such a context one might surely have expected to find that cattle-breeding and swine-herding were more important than sheep-raising.

It would be a mistake to imagine that under the primitive conditions obtaining in Neolithic and still to a limited extent in mediaeval Europe there was any such hard and fast distinction between 'domesticated' and 'wild' animals, as we are accustomed to draw today. In studying animal remains from early sites zoologists have commonly observed signs of crossings between 'domesticated' and 'wild' forms and certain varieties of cattle are currently interpreted as a result of interbreeding between indigenous wild ones and supposedly introduced tame breeds. Again, it has been remarked, especially in the case of pigs, that every gradation may be found morphologically between remains of demonstrably 'wild' and 'domesticated' forms respectively (44). When the so-called domesticated animals were often half wild, it would be artificial to

⁴⁰ A. Sandklef, 'Are Scandinavian flint saws to be considered as leaf knives?' *Acta Arch.*, v, 1934, 284-90; A. Steensberg, *Ancient Harvesting Implements*. Copenhagen, 1943, pp. 179 f.

⁴¹ Strabo, 4.5.2.

⁴² R. Lydekker, *The Sheep and its cousins*. London, 1912, pp. 27 and 43.

⁴³ See Grahame Clark, 'Farmers and Forests in Neolithic Europe', *ANTIQUITY*, 1945, 57-71, for further references.

⁴⁴ A. Pira, *op. cit.* It may be added, also, that until mediaeval times 'domesticated' swine were kept in the forest, where as Marc Bloch has stated (*Les Caractères originaux de l'histoire rurale française*. Oslo, 1931, p. 7) they existed 'presque à l'état de nature'.

consider them in relation to their environment without taking account of the fauna as a whole.

If we turn to the wild animals hunted by Neolithic man—and for that matter by his Mesolithic predecessors—we find that forest species, supplemented by freshwater or coastal ones as the case may be, were overwhelmingly predominant and that species adapted to open or steppe conditions were correspondingly rare. Red deer, elk, roe deer, aurochs, wild pig and a series of fur-bearing animals abounded, whereas field hares and horses, the former extremely common both in Switzerland and Denmark at the present day, were both conspicuously uncommon.

While it can hardly be excluded that the extreme rarity of remains of field hares from the Swiss lake-villages (45), first noted by Rüttimeyer (46) and later emphasized by Hescheler (47), was due to their avoidance by prehistoric man, for which we have the testimony of Caesar in the case of the Iron Age Britons (48), the simpler explanation is surely that ecological conditions were unfavourable to them. The Danish zoologists Winge (49) and Degerböl (50) have not hesitated to link their virtual absence from the large Mesolithic assemblages (51) of the inland bogs and coastal middens and their rarity from Neolithic sites (52) with the virtual absence of open country at the height of the forest period.

Wild horses were equally rare and their general absence in these areas may be attributed to the same cause. Remains of horse are entirely absent from the two lower levels at Port-Conty and occur only as isolated individuals at other Neolithic sites in the area (53) such finds being attributed by experts to wild species (54). Horses are equally rare in the large assemblages of sub-fossil animal remains from Denmark (55). Again, they are absent from the Neolithic 'camps' and uncommon in the Long Barrows of southern England (56).

⁴⁵ A broken shin-bone was noted from Moosseedorf and traces of single individuals were found at Port-Conty, St. Aubin (levels III, IV) and at Wauwyl.

⁴⁶ L. Rüttimeyer, op. cit., 1862, 24.

⁴⁷ K. Hescheler, 'Die Fauna der neolithischen Pfahlbauten der Schweiz und des deutschen Bodenseegebietes nach neueren Forschungen', *Vierteljahrsschrift d. Naturf. Ges. Zürich*, Jhg. 78, 1933, 198-231. s. 209, 228.

⁴⁸ *De Bello Gallico*, v, 12, para. 6.

⁴⁹ Madsen *et al.*, op. cit., 1900, 181-2.

⁵⁰ M. Degerböl, 'Danmarks Pattedyr i Fortiden i Sammenligning med recente Former', *Vidensk. Medd. fra Dansk. naturh. Foren.*, bd., 95, 1933, 357-641.

⁵¹ The only find from mesolithic Denmark comprises one bone from Mullerup, Zealand (G. F. L. Sarauw, 'En Stenalders Boplads i Maglemose ved Mullerup', *Aarbøger*, 1903, 148-315).

⁵² A few bones occurred in the midden at Lejre Aa (Madsen *et al.*, 1900, 171; M. Degerböl, 1933, op. cit., 388) and a single one at Lindö (Winther, op. cit., 1928, 47).

⁵³ e.g. Wauwyl (Hescheler, op. cit., 1920, 292) and Obermeilen (Kuhn, op. cit., 1935, 256-9, 321).

⁵⁴ e.g. by Hescheler and Kuhn (op. cit.) and by P. Vouga, 'Le néolithique lacustre ancien', *Receuil de travaux publiés par le Faculté des lettres, Univ. de Neuchâtel*, 1934, fasc. 17, p. 58.

⁵⁵ Only one tooth from Vinde-Helsing in Aamosen, Zealand (T. Mathiassen *et al.*, *Stenalders-boplads i Aamosen*. Copenhagen, 1943, pp. 165-7) and part of a femur from the lowest level at Kolind, Jutland (T. Mathiassen *et al.*, *Dryholmen. En Stenaldersboplads paa Djursland*. Copenhagen, 1942, pp. 123, 127-8) can be set against the absence of any trace from the Maglemose bog sites and from the Ertebølle middens.

⁵⁶ e.g. O. G. S. Crawford, *The Long Barrows of the Cotswolds*. Gloucester, 1925, p. 26.

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Thus, it would appear that the common background of the game animals and live-stock of the earliest farmers of north-western Europe was the forest. Conversely, it is only in areas supposed to have been beyond the range of foliaceous forest that we find sheep-breeding of greater importance than swine-herding during Neolithic times. Thus at Skara Brae, sheep may well have accounted for as many individuals as cattle did, whereas swine were comparatively scarce, a situation attributed by Professor Watson to the lack of deciduous woodland (57); equally, swine were absent from a Neolithic settlement on Rousay (58) and from the Neolithic level of a chambered cairn near Midhowe (59) on the same island, whereas sheep or goats and cattle were present. Again, a Neolithic midden on the rocky islet of Er Yoh off the coast of Morbihan (60) yielded a marked predominance of sheep:

	Specimens	Individuals represented
Ox	274	12 (28.5 per cent)
Pig	31	4 (9.5 ")
Sheep	327	26 (62.0 ")

Sheep, indeed, was the only form of livestock easily kept under primitive conditions when the resources of foliaceous woodlands were lacking. The difficulty of raising cattle in the Orkney islands during Neolithic times is emphasized by the fact that nearly three-fifths had to be killed off before their first winter. Even in forested areas winter-feed was a difficulty in Neolithic times, but the numbers allowed to reach maturity in such a country as Switzerland was substantially greater, as is shown in the following table:

	Less than 1 year	1-3 years	3 years or more
Skara Brae, Orkney	10 (58.8 per cent)	4 (23.5 per cent)	3 (17.7 per cent)
Ossingen and Storren, kt. Zürich (61)	—	10 (58.8 ")	7 (41.2 ")

The proportion of sheep to reach maturity at Skara Brae was substantially higher, from which Prof. Watson concluded that 'the natural forage of the Orkneys was adequate for the life of flocks throughout the year' (61a). Among this natural forage sea-weed was doubtless as prominent as it was in modern times: describing the sheep of native stock surviving on N. Ronaldsday, Buckley and Harvie-Brown (62) remarked that 'these

⁵⁷ V. G. Childe, *Skara Brae, a Pictish village in Orkney*. London, 1931, p. 204.

⁵⁸ *Proc. Soc. Ant. Scot.*, LXXIII, 22.

⁵⁹ *ibid.*, LXVIII, 349.

⁶⁰ *Rev. anthropologique*, XXXVI, 1926, 206-II.

⁶¹ Based on Kuhn, *op. cit.*, 1932.

^{61a} In V. G. Childe, *op. cit.*, 203.

⁶² T. E. Buckley and J. A. Harvie-Brown, *A vertebrate fauna of the Orkney Islands*. Edinburgh, 1891, p. 89.

SHEEP AND SWINE IN THE HUSBANDRY OF PREHISTORIC EUROPE

have to feed themselves almost exclusively on sea-weed, a wall going round 'the whole island to keep them out of the cultivated ground . . .'. According to the same authors (63), in the Hebrides even cattle and red deer had to rely occasionally on this same source of nourishment.

If the comparatively minor role of sheep-breeding in the earliest husbandry of much of north-western Europe is to be associated with the general prevalence of forest at the time of the Neolithic settlement, then it is only reasonable to suggest that its later rise to importance may have been due to a reduction in the extent of woodland. That such must have occurred as an inevitable accompaniment of the progress of agriculture hardly needs emphasis. During the phase of shifting agriculture (64) it is true that much clearance must have been of a transient character, the forest regenerating as the peasant farmers moved on to new lands, burning and felling as they went; yet, even at this stage, it is unlikely that regeneration was everywhere complete and it is known that on some of the poorer soils, such as those of central Jutland, stretches of heathland had come into being even at the time of the late Neolithic single-grave culture. Progressively, under pressure of increasing density of settlement, the forest must have ceased to hold its own even on the richer soils and, within the area of primary settlement permanently cleared zones must have increased in size. At the same time the system of shifting agriculture itself would gradually have broken down, leading by the end of the Bronze Age to the establishment of settled agriculture with fixed fields. This in turn involved the development of régimes designed to rest the land and conserve its fertility: whereas under the extensive system a few years of continuous cropping was the rule, the adoption of a more settled system led to a sub-division of the cultivated area and the resting of one part every two or three years according to the régime.

Thus, as prehistoric agriculture grew more intensive, the forest was driven back and the area of more or less open country increased. This in itself created conditions favourable to the increase of sheep and less congenial to swine, although it must be remembered that throughout prehistoric times the area of primary settlement was often closely environed by untouched forest in which livestock could be fed. Even more important in some respects was the general institution of a fixed agricultural régime: not only must the fallow have made an ideal feeding-ground for flocks of sheep, but sheep in themselves must have been invaluable for maintaining the richness of the soil. As Lord Ernle wrote (65) of farming under the old manorial system:

'Sheep were the manure carriers, and were prized as much for their folding quality as for their fleeces. In some districts they were kept almost entirely for their agricultural value to the arable land'.

Sheep-breeding, then, fitted neatly into the pattern of settled farming and it is significant that both rose to importance over much of north-western Europe at the same time.

So soon as ecological conditions permitted, there were several possible incentives for maintaining sheep, in addition to the provision of manure for permanent fields. Although it is unlikely that the light, deer-like sheep of prehistoric times were bred primarily as food-animals, there is plenty of evidence that mutton and lamb were eaten

⁶³ T. E. Buckley and J. A. Harvie-Brown, *A vertebrate fauna of the Outer Hebrides*. Edinburgh, 1888, p. 42.

⁶⁴ Grahame Clark, 'Forest Clearance and Prehistoric Farming', *Economic History Review*, xvii, no. 1, p. 45 f.

⁶⁵ Lord Ernle, *English Farming Past and Present*, 1917 edtn., p. 27.

and analogy with what is known from more or less contemporary Greek sources (66), as well as with later practice in Britain and other parts of Europe, suggests that sheep were milked, at any rate in regions where they were folded. In the case of the half-wild sheep of Soay, with which our prehistoric sheep have often been compared, wool is still down to our own day their main and, indeed, almost their sole product (67), and even in the regions of sheep-folding in the south of England wool was probably, at least locally, the main object of sheep-breeding. There is impressive evidence for this at Glastonbury, where sheep formed no less than 88 per cent of the abundant animal remains, as against 5 per cent cattle, 2 per cent pig, 2 per cent horse, 1 per cent dog and 2 per cent wild animals (68). Numbers of bone weaving-combs, bobbins made from sheep metacarpals and metatarsals, clay loom-weights and loom-frame timbers bear witness to weaving activities on a scale far beyond that required for the immediate needs of the villagers themselves. As Prof. Childe has emphasized (69), the marsh villages, so far from being places of refuge, were actually centres of industry: evidently Glastonbury was the seat of a textile export industry, the raw material for which was obtained by the flocks of sheep grazed on the Mendips and possibly also on the Poldens.

Although, locally at least, the desire for wool must have stimulated sheep-breeding, it is equally true that woollen textiles only came into use as conditions became progressively more favourable to sheep-grazing. Such evidence as we have for Neolithic textiles in north-western Europe indicates that these were made exclusively from plant fibres: linen was already woven from flax at this time in the Alpine area (70) and possibly, also, in the Low Countries (71); nettle (72) and even bast (73) fibres may also have been used. Wool textiles, on the other hand, did not appear, according to present evidence, until the full Bronze Age in Britain (74) or Denmark (75) and until its close in the Alpine area (76).

⁶⁶ e.g. Homer's description (*Odyssey*, ix, 217-49) of how Polyphemus the Cyclops used to manage his flock of sheep and goats, the ewes being brought to the cave for milking.

⁶⁷ H. J. Elwes ('Notes on the primitive breeds of sheep in Scotland', *The Scottish Naturalist*, 1912, 17, 25-32 and 49-52) wrote that all the Soay sheep 'know of man is that once or twice a year at most they are hunted down with dogs, and the little wool they have is pulled from their backs. For the rest of the year they are as wild as the sea-birds which constantly surround them'.

⁶⁸ The percentages are expressed as proportions of the total number of specimens identified (3426).

⁶⁹ V. G. Childe, *Prehistoric Communities of the British Isles*. London, 1940, p. 241.

⁷⁰ E. Vogt, *Geflechte und Gewebe der Steinzeit*. Basel, 1937. s. 45-6.

⁷¹ An impression of a flax seed has been identified on a sherd from Drenthe prov. of a type found in the megalithic tombs of N. Holland (K. Jessen and H. Helback *Cereals in Great Britain and Ireland in Prehistoric and Early Historic Times*. Copenhagen, 1944, p. 57).

⁷² The use of nettle fibres for weaving is a feature of the folk culture of the Scandinavian and Finno-Ugrian peoples and in the former area goes back at least to the Bronze Age, and in all probability to the Stone Age. The best reference is Margrethe Hald's 'The Nettle as a culture plant', *Folk-Liv*, 1942, 28-49, which carries a valuable bibliography.

⁷³ For net-making bast was used as early as Mesolithic times in the Baltic area (S. Pälvi, 'Ein steinzeitlicher Moorfund bei Korpilahti im Kirchspiel Antrea, Län Wiborg', *Finska Forn. Tidskr.* xxviii, no. 2. Helsingfors, 1920). A well-known Neolithic find from Denmark is the piece of net from Ordrup Mose, near Copenhagen (H. C. Broholm and M. Hald, *Skrydstrupfundet*. Copenhagen, 1939, p. 54 and fig. 40).

⁷⁴ Finds of charred textiles, and impressions of textile on the verdigris of bronzes, have been recorded fairly commonly in the literature of barrow excavation from the pre-scientific era. Where

[continued on next page]

A point to notice about the Danish samples from the Bronze Age is that so many coarse hairs were incorporated in the weave that it was originally held that these must indicate admixture of deer hairs with the sheep wool (77); more recent work has shown (78) that in reality the raw material was all derived from sheep of the type still found in the Faroes with a coat having numerous coarse hairs. Investigation of samples of woollen textiles from the Roman Iron Age in Denmark (79) showed, on the other hand, that only two out of twelve showed any traces of coarse hairs, as against thirty-one out of thirty-six of the original Bronze Age ones. This suggests, not only that sheep-breeding in Denmark was still at a low stage of development during the Bronze Age, but further that in the course of the Iron Age a substantial improvement was effected in the quality of the fleece. Since there is no suggestion of a comparable improvement in their build, the prehistoric breeds of Britain being habitually compared with the half-wild sheep of Soay (80), it seems that sheep were bred primarily for their wool.

In general, as Emil Vogt (81) was the first to point out, there is an obvious connexion between the nature of the fibres used for weaving and the composition of the flocks and herds at any particular stage of prehistoric times: in the Neolithic period, when sheep were relatively inconspicuous, textiles were woven exclusively from plant fibres; only in the Bronze Age, when sheep-breeding first became important in all but marginal areas, did woollen fabrics first appear. There is thus an intimate connexion between the progress of forest clearance, the advance of sheep and the rise of a woollen industry in north-western Europe.

This discussion began by considering the changed proportions, in which sheep occurred on the chalk downs of southern England as between Neolithic and Early Iron Age times. One may conclude by following a thread of evidence especially prominent in this particular region, the molluscan faunule from archaeological sites so indefatigably identified by Mr A. S. Kennard. So far as the Neolithic causewayed camps and flint-mines of the Sussex and Wiltshire Downs are concerned, their faunules have consistently been held to indicate damper conditions than those prevailing today. As a rule

continued from previous page

determinations have been made, these have been subjective and little reliance can be placed on them. Reference may, however, be made to a charred piece of what appeared to be wool fabric from among the ashes in an overhanging rim urn from Bannside Moor, Coniston (*Cumb. and Westm. Arch. and Ant. Soc.*, 1910, p. 350).

⁷⁵ The great mass of Danish prehistoric woollen textiles belong to the Great Period of the Northern Bronze Age (1300-1000) and come from the well-known oak coffin burials. The earliest indication from Denmark is the impression of woollen textile in the verdigris of a socketed spear-head from a burial at Stubdrup, Øster Brønderslev, Vendsyssel, dating from the local Early Bronze Age (1500-1300) (H. C. Broholm, *Aarbøger*, 1938, 81).

⁷⁶ A piece of decorated woollen textile was found wrapped round the wooden handle of a winged axe in the roof of the gallery of a salt-mine at Durrnberg, near Hallein, dating from the Late Bronze or Early Iron Age (O. Klose, 'Ein buntes Gewebe aus dem prahistorischen Salzbergwerke auf dem Durrnberge bei Hallein', *Mitt. d. anthrop. Ges. in Wien*, lvi, 346-50. Vienna, 1926).

⁷⁷ B. Gram, 'Undersøgelser af archaeologisk materiale udførte i Prof. Steins laboratorium', *Aarbøger*, 1891, 97-123. Copenhagen.

⁷⁸ A. Geijer and H. Ljungh, 'Die Kleider der Dänischen Bronzezeit', *Acta Arch.*, viii, 266-75. Copenhagen, 1937. Also, A. Steensberg in Broholm and Hald, op. cit. 1939, 137-42.

⁷⁹ T. Thomsen, 'Vaevede stoffer fra Jernalderen', *Aarbøger*, 1900, 257-278.

⁸⁰ A. Bulleid and H. St. G. Gray, *The Glastonbury Lake Village*. Glastonbury, 1911, p. 658.

⁸¹ E. Vogt, op. cit., 44-5.

Mr Kennard has fought shy of specifying the kind of vegetation which they imply, but on at least two occasions he has expressed definite opinions : of the mollusca from the flint-mines on Easton Down, Wilts., he states that it was definitely not that of open downland and, further, that of the two alternatives of a beechwood or 'an open wood with open spaces and scrub between the trees' he considers the former to have been the more probable (82) ; again, he remarked of Whitehawk Camp, Sussex, that 'the faunule is that of damp woodland or scrub, and (that) these conditions must have existed on the Downs when the Camp was occupied (83)' Such indications are the more remarkable that, as Kennard himself has pointed out (84), 'in an occupied site one does not get the full fauna ; that would exist only outside the occupied ground'—cleared areas must have existed immediately around the heads of the mine-shafts.

On the other hand, faunules from sites dating from the period when sheep-breeding first became important on the chalk downs are held, where Mr Kennard has been explicit, to indicate much more open conditions. Thus, the mollusca from Boscombe Down East, Wiltshire, was judged (85) to indicate 'grassland conditions' and those from a contemporary site at Thorney Down (86) in the same county 'a rather coarse grassland and no scrub or woodland growth'. Again, to take two Early Iron Age sites on the Hampshire Downs, each of the seven samples from Meon Hill were held to imply 'open grass country', in four cases with some herbage (87), and analogous results were obtained from Quarley Hill (88). Thus, the mollusca from prehistoric sites on the chalk downs suggest that between Neolithic times and the end of the Bronze Age woodland and scrub had given place to open grassland with some herbage ; moreover, we know from the existence of 'Celtic fields' that parts of the chalk downs were cultivated at this period, probably on the two-field system, but in any case with a proportion of fallow. Thus, the relative decline of swine-herding and the rise of sheep-breeding and of a woollen textile industry were closely linked in north-western Europe with a change in plant ecology, itself brought about by the progress of forest clearance and by the development of settled farming.

⁸² *Wilts. Arch. Mag.*, XLVI, 240.

⁸³ *Ant. J.*, XIV, 130.

⁸⁴ *Sussex Arch. Soc. Coll.*, 1936, 91.

⁸⁵ *Wilts. Arch. Mag.*, XLVII, 484-6.

⁸⁶ *ibid.*, 659.

⁸⁷ *Hants. F. C. and Arch. Soc.*, XII, pt. 2, 157-8.

⁸⁸ *ibid.*, XIV, pt. 2, 192.

The Sutton Hoo Helmet

by HERBERT MARYON*

WHEN unpacked at the British Museum Laboratory, the remains of the Sutton Hoo helmet covered a good-sized table. They appeared to consist of a gilded bronze nose and mouth piece, two gilded bronze dragon heads, parts of what once had been a silver crest, and three or four hundred fragments of sand-encrusted rusty iron.

No photographs had been taken of them during excavation as their importance had not been realized at the time.

Though almost all of the pieces were of iron they were so corroded that little metal remained, being just masses of rust, encrusted with sand. Some were friable; others had become mineralized and, in fact, had been partially transformed into limonite—a hydrate of iron. Traces of ornament and mouldings showed upon them.

When sorting the fragments, I found that to facilitate the handling of each piece, and to preserve any delicate edges, it was a good plan to provide each fragment with a piece of stiff card, upon which it could rest, and by which it could be lifted. On each card the outline of the fragment was drawn, and notes made of details of any ornament or other feature of interest which had been observed. Search through, and study of, the recovered fragments continued for a long while, but gradually some more general observations became possible.

The helmet had been constructed of sheet iron, its thickness being about $\frac{1}{16}$ inch. The crown of the head had been entirely covered by an iron cap, something like the crash helmet of a motor cyclist. Its surface was probably about $\frac{3}{8}$ inch wider all round than its wearer's head, to allow for the usual padding; and the crown rose rather more than an inch above the top of the skull. A few overlapping pieces had survived, where two separate thicknesses of iron could be detected, but in no case did a riveted joint survive. The sand-encrusted fragments varied from $\frac{1}{16}$ inch to $\frac{3}{8}$ inch in thickness, but so brittle were they that no general reduction of thickness seemed desirable. The outside of the iron plates had been covered with sheets of very thin tinned bronze, stamped with patterns, and arranged in panels. All the free edges of the helmet were protected by a U-shaped channel of gilt bronze, clamped on, and held in position by narrow gilt bronze ties, riveted on. The visor and neck-guard were fixed rigidly to the main body of the helmet, but the cheek-guards were each provided with a bronze hinge. Other details of construction are given in the more detailed description below.

Almost the whole surface of the helmet is covered with thin embossed plates of ornament. The method by which these relief patterns were produced is worthy of attention. The northern craftsmen were skilled in the art of producing patterns in relief. Sometimes, of course, they modelled the pattern in wax or clay and cast it, as in the case of the tortoise brooches, perhaps chasing up the surface later. But many of their works show that the craftsman was prepared to carve, directly out of solid metal, any all-over pattern that might be required.

* The views expressed in this article are those of the writer, and must not be regarded as representing the official views of the British Museum.

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Now, on this helmet there are three different designs provided for figure panels, and two different designs for interlaced dragon all-over patterns. A single die or punch for each of these five designs was probably carved in solid bronze. Then the punch would be laid on the anvil. A piece of very thin bronze sheet, whose surface had been given a wash of tin, would be laid over the punch, tinned side up. A block or strip of lead would be laid overall, and, by repeated blows with a heavy hammer the smith would drive the sheet bronze and its lead backing into the pattern on the bronze punch, which, being uninjured, would serve to produce many more impressions.*

It would have been possible to carve the punch in intaglio instead of in relief, but I believe that the northern smith preferred the former method, and the sharpness of the impression at the back of the plates seems to confirm this. On the Sutton Hoo helmet the silvery hue of the original tinned surface of the panel may yet be seen on one part of the background of the helmeted warrior (Panel DB). In general the original tinned bronze surface has changed to one of tin and copper salts, stained with iron. Their present average colour is a rusty brown.

The embossed bronze sheets, whether of figure work or ornament, were laid over the iron foundation, and framed by lengths of moulding. The moulding, generally of four or five parallel ridges, was swaged from strips of tin. This could easily be bent in any direction. The moulding overlay the edges of the panels, covering some of the ornament. It was fixed in place by bronze rivets, the tips of which were slightly domed. The mouldings were gilded. Some of the gilding may be seen on the moulding on the right hand side of Panel sc.

THE FIGURE PANELS

In the course of our preliminary examination of the fragments finds soon began to be made. Dr Plenderleith discovered the figure of a warrior wearing an elaborate branched helmet, and holding two spears in his left hand. His right arm and legs were missing. We were delighted to see him, for he was an old friend. Figures with a similar headdress had been found in Sweden. They belonged to the Vendel age. One such figure is known from a bronze plate found at Torslunda, on the island of Oland, in the Baltic. Such a warrior is sometimes associated with the figure of a bear, which stands opposite him, and is led by a rope. Later, I found the torso of what I thought to be some such figure. The body was covered with a scale pattern. One arm, a hand, part of the face and the legs were missing.

Then, one day I found a fragment which provided me with a new problem. The fragment was a hard mass apparently of limonite, nearly 2 inches long, and rather more than $\frac{1}{2}$ inch wide. On one side was a modelled surface, in intaglio—not in relief. It was evidently some kind of a mould, and, as it seemed to be part of a figure panel, it was valuable. Upon consultation with Dr Plenderleith it became clear what had happened. The fall of the roof of the burial chamber had smashed the already rusty helmet to fragments. These lay for centuries amid the decaying remains of the timber structure and the masses of sand which had come down from above. Through it all ran water which carried iron in solution. Slowly, over long years, a deposit of iron rust covered the broken pieces of the helmet. Even over the gilding it became strong and closely adherent. It cemented to them in many cases large masses of sand, and in others it deposited a clean layer of brown hematite, free from grit. It was a deposit of this nature

* Good examples of the same technique are found on the thin metal ornamental facings around the base of the shield (cf. *ANTIQUITY*, March 1946).

THE SUTTON HOO HELMET

that I had found : a mould formed by nature reproducing the ornament which otherwise would have been lost for ever where the bronze plaque decayed.

It was the case, indeed, that the original iron foundation of the helmet fragment, with its thin covering of embossed bronze, had almost completely perished. So it seemed to me that if I could clean the surface of the mould I might be able to get a good cast in plaster of Paris of the lost original. Therefore I first strengthened the back of the fragment with plaster, and then very carefully cleaned and oiled the modelled surface. The cast showed that I had found part of that figure with a scale-covered body which I had originally thought to be a bear or dragon. But now I discovered that he had human legs. Then I noticed that his feet did not touch the floor. Could he be dancing ? Or was he lying on his back with his feet in the air ? The latter proved to be the correct solution, for later I found that a mounted warrior was riding over him, and he was thrusting a sword into the horse's chest.

Gradually I was able to reassemble the remaining parts of this recumbent figure : a hand holding the hilt of a sword ; another arm, with the sword blade ; and finally his chin. He was a man after all.

As I worked my way through the fragments, examining and cleaning each piece, other parts of the panel appeared. I came across the horse's neck and part of his head. Then I found a fragment which gave me the whole of the upper border of the panel. The mounted warrior bore a spear over his shoulder (a spear with two large lateral bosses, one on either side of the socket—surely a rare type). Behind the warrior, filling the space above the horse's rump, was a second figure, smaller, and in a kneeling position, armed with another spear. Later, the mounted warrior's shield and knee came to light, and eventually nearly the whole of the design of the panel became clear. It was made up from ten different fragments, but the horse's hind legs and a few other parts were missing. It is interesting to note that each man wears fluted cuffs or gauntlets.

Here one may remark that though the craftsman who designed and carved the panel was poor in his proportions—the rider's head is far too large, and his body is weak—yet the modelling of the fallen warrior's legs is excellent. I do not know of a better pair in Vendel art.

The recovery of the original design for the panels on which appear the warriors with the elaborate branched helmets came about as follows. At the time of the original reconstruction of the helmet there seemed to be insufficient material to reconstruct this panel. So the surviving fragments were mounted on the helmet in what was felt might be their correct position. This was done so that by publication the attention of scholars might be directed to them, and the existence of any parallel examples might be reported.

Now it happened that Mr Bruce-Mitford, on a visit to Sweden, observed at Uppsala on a hitherto unpublished helmet from Valsgärde, a recently reconstructed panel. On this are the figures of two warriors, similar to those on the Sutton Hoo panel, standing side by side. Their outer hands hold spears, and their nearer hands hold swords above crossed spears, as on a fragment from Sutton Hoo. As a result of this valuable discovery the reconstruction of the panel itself and the consequent rearrangement of the panels on the helmet now becomes possible.

The design of the third figure panel remains unknown. The only surviving part of its original surface is a solitary leg, from knee to foot, about $\frac{1}{2}$ inch high, which still retains its original place in the panel. All the remainder of the design has disappeared, possibly broken away when a strong spike was driven through the helmet from the inside, breaking away the greater portion of the embossed figure work.

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The arrangement of the figure panels is as follows :—

Sinister side. Crest in front ; Panel SA Interlaced ornament ; SB Twin helmeted warriors ; SC Mounted warrior ; SD Mounted warrior ; SE Solitary leg ; SF Interlaced ornament ; Crest at back.

Dexter side. Crest in front ; Panel DA Interlaced ornament ; DF Twin helmeted warriors ; DC Mounted warrior ; DD Mounted warrior ; DE Mounted warrior ; DF Interlaced ornament ; Crest at back.

THE NUMBERING OF THE PANELS

For convenience of reference the rows of panels, and the panels themselves, are numbered as stated below. The heraldic terms 'dexter' and 'sinister' are employed in describing them, dexter referring to that side of the helmet on the wearer's own right hand, but the left hand side of any picture of the front of the helmet. Commencing in front, near the crest, the panels are named DA (Dexter A), DB (Dexter B), DC, etc., for those panels on the dexter side. The corresponding panels on the other side of the crest are named SA (Sinister A), SB, SC, etc. Most of the panels bear figure subjects, but four have interlaced dragon ornament, as already noted. Above this first row of panels come three more tiers of panels. Commencing on the dexter side near the crest in front, the panels of the first row above the figure panels are numbered D101, D102, D103, etc. The corresponding row of panels on the sinister side commences at S101, S102, S103, etc. Panels in the second row above the figure panels are numbered D201, D202, etc., and panels in the third row D301, D302, etc.

THE PANELS OF INTERLACED ORNAMENT

Above the band of figure panels the whole of the remaining surface is completely covered by panels of interlaced dragon ornament, arranged in three tiers.

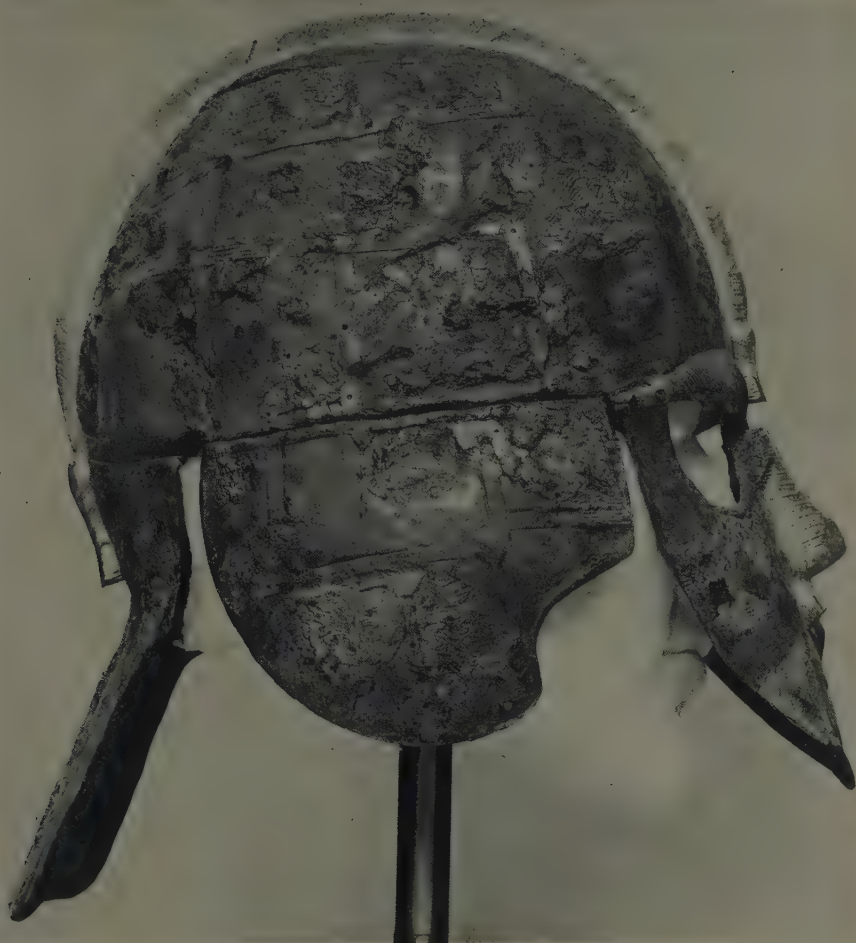
The recovery of the original arrangement of the three tiers of ornamental panels provided some interesting problems. The line of the upper moulding of the figure panel rises a little as it passes over panel SC. It must have curved over the top of SB. It would naturally take a similar line on the dexter side of the head. Then the single fragment which forms practically the whole of panels SE and SF, forms panel S104 also. This is a longish, narrow panel tapering narrower towards the back of the head. The fragment has upon it part of the heavily gilded moulding which fits against the crest. Moreover, from its strong curvature it could only have come from a site covering part of the occipital bone. So its proper position was never in doubt. The second row of panels must therefore have become shallow as it approached the back of the helmet.

How did it come at the front ? Now the fragment which forms panel S101 shows that that was a tapering panel also. This fragment would not fit in anywhere towards the back of the head. From the inclination of its mouldings it would go comfortably only in a position just so far up the slope of the top of the helmet as was finally adopted. With these fragments temporarily fixed in position with plasticine the provisional line of the mouldings could then be worked out with tapes.

THE CREST

The helmet terminated above in a silver crest. A considerable portion of this survives. It ran from front to back across the top of the helmet and terminated at either end in a dragon's head of gilt bronze. The body of the crest was formed from a D-sectioned iron tube, covered with a silver plate about $\frac{1}{8}$ inch in thickness. The width

PLATE I

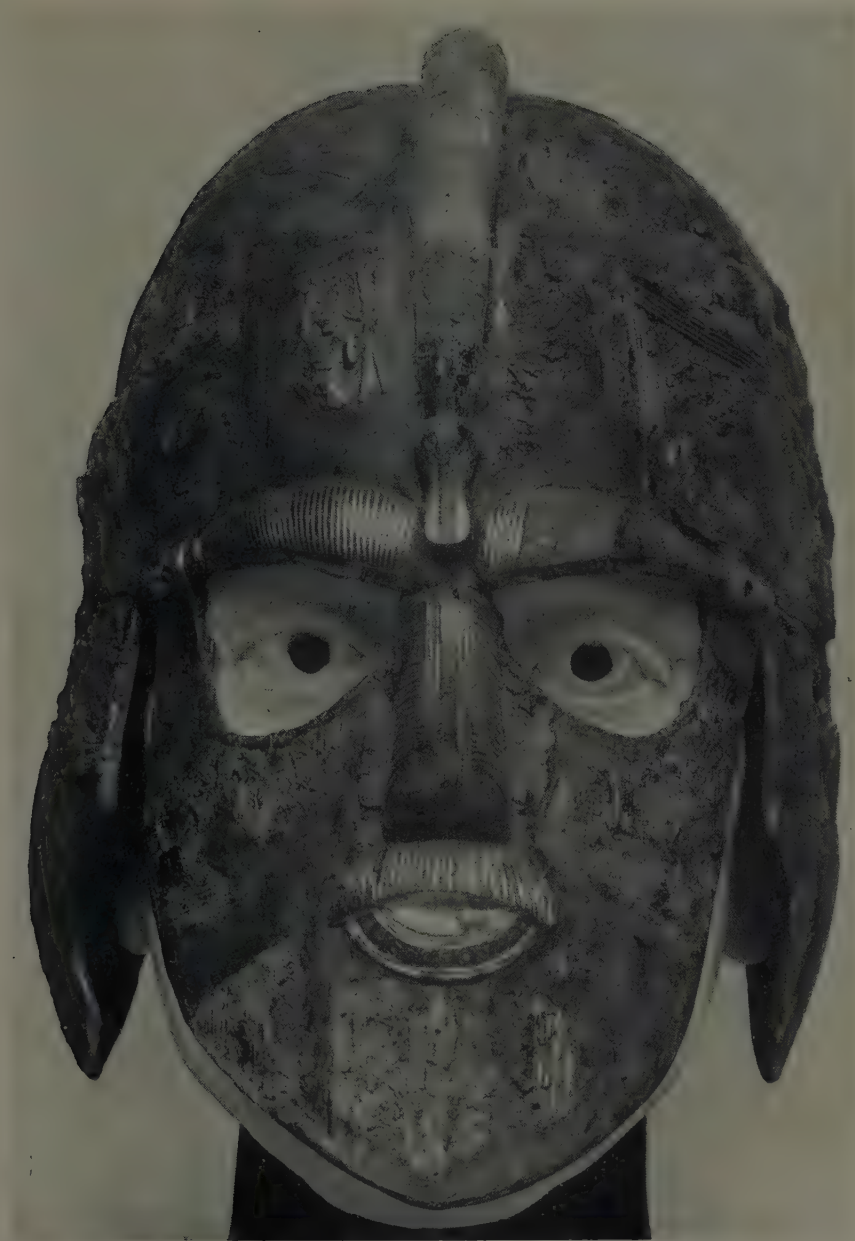


SUTTON HOO, THE HELMET, DEXTER SIDE

PLATE II

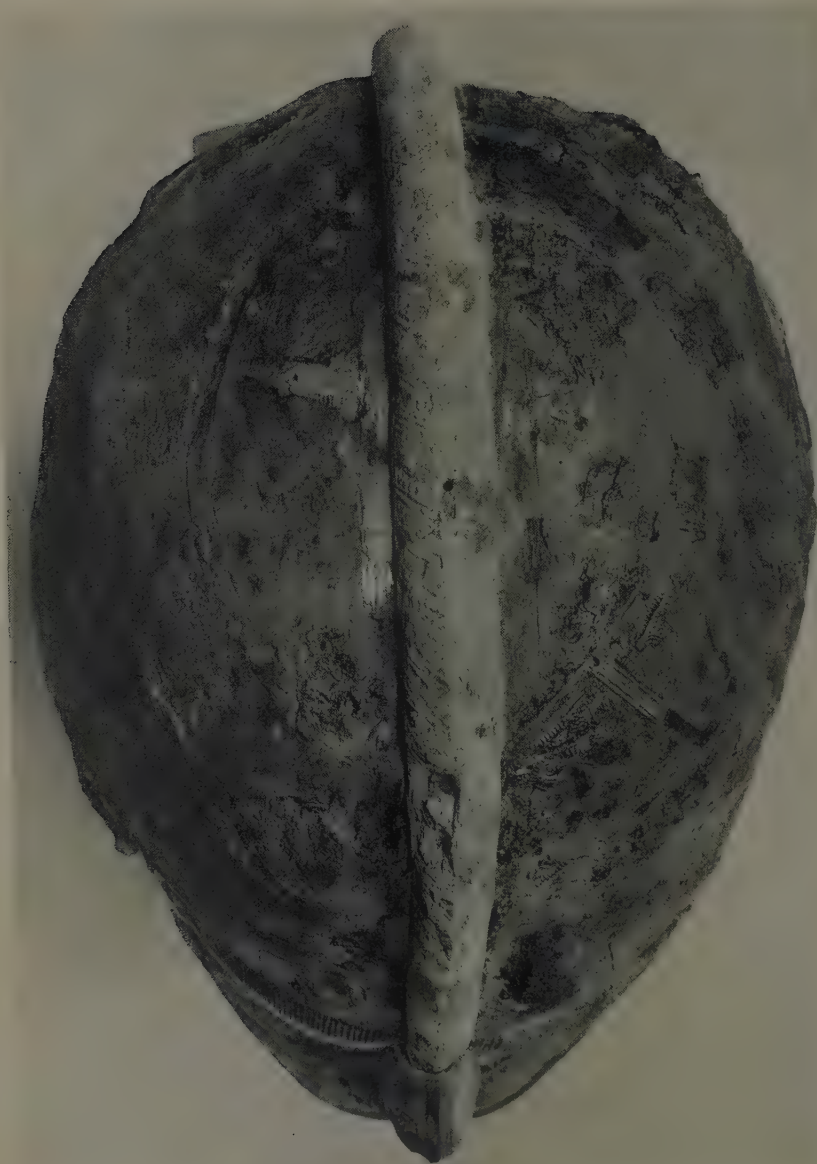


SUTTON HOO, REAR VIEW OF THE HELMET



SUTTON HOO, THE HELMET

PLATE IV



SUTTON HOO, TOP VIEW OF THE HELMET

THE SUTTON HOO HELMET

and height of the crest varied from about $\frac{3}{8}$ inch in the centre to about $\frac{1}{2}$ inch in front and rear. The crest is decorated with lines in low relief, left raised when their background was punched down. Along the summit of the ridge runs a zigzag line between two parallel lines. All three run the full length of the crest. A single, small rivet hole survives. It is in the centre line at the top of the curve. It is unlikely that any device projected above the crest, for it would have hidden the zigzag ornament along the ridge.

The sides of the crest are covered with a repeating pattern of three parallel lines and one zigzag line. All these lines slope downwards from the crestline at an angle of about 60° (FIG. 1, B). A somewhat similar chevron-like pattern decorates the crest of the helmets Vendel I and XII, and Valsgärde V and VIII. In each case the slope of the pattern is downwards towards the back. It was this backward slope of the side decorations of the crest in the Sutton Hoo helmet which helped to determine which end of the crest should point towards the back. For a space of about an inch above the front dragon's head, the sides of the crest are decorated with a different pattern, which, owing to its present fragmentary condition, it is difficult to identify with certainty. A break in the crest here prohibits any exact observation of its meeting with the principal pattern (FIG. 1).

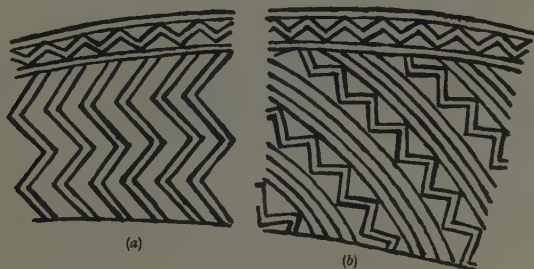


FIG. 1. PATTERNS ON THE CREST

THE DRAGON HEADS

The dragon heads at either end of the crest are of cast bronze, and measure about 2 inches in length. They are very heavily gilded, and are provided with garnet eyes. They are decorated with patterns formed with a ring punch. A silvery stripe from forehead to nose has a nielloed pattern of ring punch marks.

The head at the back of the helmet appears to have had no cast socket to join it to the crest: no scar remains, a half collar of gold foil, decorated with punched ring patterns, served instead. The dragon head in the front of the crest is provided with a cast 'roof-ridge' half socket with ring punch decorations. This socket fitted one end of the crest. There is a slight change of plane between the socket and the head. On either side of the crest, for its full length, runs a very heavily gilded moulding. In assembling the many fragments, missing parts of the crest and of other parts of the helmet were represented in coloured plaster.

THE EYEBROWS

The eyebrows are formed of hollow bronze castings, each decorated with about 40 parallel silver wires, separated by as many lines of niello. Along the lower edge of the eyebrow, forming the upper margin of the orbit, is a row of garnets, each stone set

above a piece of hatched gold foil. At the outer end of each eyebrow is a finely modelled boar's head, in profile, heavily gilded (FIG. 2). The tusk in the lower jaw is very prominent. The inner end of the eyebrow castings is provided with a small filed notch or step where it fits against, and was rivetted to, a projecting lug at the top of the nose-piece casting. The inner ends of the eyebrows are thus separated by a space of about $\frac{1}{2}$ inch, as in the pair of eyebrows from a helmet found at Högbro, Halla parish, Gotland. It will be remembered that in some of the helmets of the Vendel age a small bronze human head comes between the dragon's head which terminates the crest and the top of the nose. In the Sutton Hoo helmet no such human head was provided, and the front teeth of the dragon were accordingly exposed to view and show perfect detail of finish.

THE VISOR

The most striking feature in the whole helmet is the visor. The nose and mouth-piece is formed from a single bronze casting, with very heavy gilding. The nose is slightly cored out behind, but the width of the opening is insufficient to allow the end of a human nose to enter the hollow, the maximum width being but $\frac{1}{2}$ inch. In the reconstruction of the helmet, therefore, it was necessary to so arrange the position of the visor that the helmet could be worn without inconvenience. On the underside of the



FIG. 2. BOAR'S HEAD



FIG. 3. RIDGE OF NOSE



FIG. 4. ACROSS TOP OF NOSE

bronze nose were two small holes, but these served no practical purpose as the nostrils of the wearer were in a position free from obstruction.

Down the middle line of the nose runs a band of ornament (FIG. 3). A strip of silver was inlaid here, and decorated with a pattern of two pairs of little silver triangles, facing alternate ways and forming a double zigzag, shown against a background of niello. The background was punched down, leaving the triangles in relief. The recesses were then filled up with niello. On either side of this band runs a beaded ridge and two grooves. The beads were formed by nicking a narrow ridge across at intervals with a tracer (chisel). The beads are therefore not round.

From the band of ornament down the middle of the nose towards the facepiece at either side run a number of strong grooves and ridges. The main ridges between the grooves are nicked across at intervals as before. All this work was done by chasing tools, not by casting.

Across the top of the nose is another narrow band of punched and nielloed ornament on silver (FIG. 4). A similar band runs round the lip (FIG. 5). On either side of the nose, on the visor, runs a five-ribbed moulding of tin.

The treatment of the moustache is similar to that of the sides of the nose, with one exception. In the centre two grooves come side by side without the intervention of a beaded ridge, as is usual elsewhere. The bronze nosepiece was rivetted to the visor. Some of its projecting lugs, and their rivets, survive.

The fragments forming the upper border of the visor and the lower margin of the orbits have almost all survived. The original shape of the orbits could be recovered without difficulty by solving a simple 'jig saw puzzle' and a good length of the outer

THE SUTTON HOO HELMET

border of the visor was assembled. Again, the fragment which covers most of the chin could be placed in its correct position, for the bronze mouthpiece had left a clear curved line where it had overlain the ornamental metal plate beneath it. The placing of the next fragment, that which forms part of the edge of the visor on the dexter side, was effected by measuring the width of the repeat of the panels of interlaced ornament, sliding the fragment into its lateral position, and then moving it about in a vertical direction till its outline caught up the curve. The vertical patterns on the visor do not run right through. They are interrupted opposite the moustache by a band of similar ornament running horizontally. The whole of the pattern on the visor is of the smaller interlaced dragon ornament (FIG. 6).



FIG. 5. CURVE OF LIP

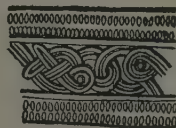


FIG. 6
THE SMALL PATTERN

THE CHEEK GUARDS

The cheek pieces were constructed, like the rest of the helmet, of sheet iron covered with embossed plates. For convenience of reference the panels are distinguished in the following manner. For the dexter side, the upper row of panels, commencing at the front, Upper DA, upper DB, etc.; with corresponding titles for the sinister side. The lower range of panels are called Lower DA, lower DB, etc.; with corresponding titles for the sinister side. In the reconstruction, the fragments forming the cheekpieces were assembled on pieces of wire gauze.

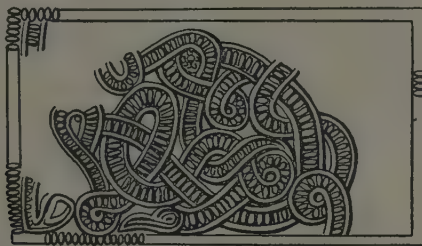


FIG. 7. THE LARGE PATTERN

Each cheekpiece was originally attached to the helmet by a bronze hinge, parts of which, and fragments of rivets, yet remain in a depressed area on panels Upper SA and Upper SB. A corresponding disturbance of the surface of the panels above may be noticed. On the dexter side traces of the hinge appear on panel Upper DB, also on the panels above. It should be noted that the fragment which forms the upper right hand portion of panel Upper DB is a plaster cast. The original survived only as a mould in limonite. But, owing to its importance in demonstrating the form of the hinge, it was decided to mount the cast with the other surviving pieces of the helmet. Panels Lower SA and Lower DA are decorated with the smaller interlaced dragon ornament, similar to

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that on the panels of the visor. All the other panels on the cheekpieces are decorated with the larger interlaced dragon pattern (FIG. 7).

THE NECK GUARD

There are three rows of panels on the neckguard. Commencing at the top they are numbered right across from left to right 1A, 1B, 1C, etc.; 2A, 2B, etc.; 3A, 3B, etc. A notable characteristic of the neckguard is the change of plane at the foot of the first row of panels. These panels conform with the general line of the back of the skull, and the lower ones suggest the line of the neck. The change of direction is clearly defined on those fragments which form parts of both the first and second row of panels. The panels in the upper row are decorated with the larger interlaced dragon pattern. Those of the two lower rows with the smaller pattern. At about $\frac{3}{8}$ inch above the bottom edge of the neckguard there is the trace of a horizontal line across all four panels. This might indicate that a series of traverse panels occupied the space below, but the traces left are indeterminate. The dragon's head reaches down as far as the point where the line of the neckguard changes direction. The surviving fragments of the neckguard are built up on a wire gauze foundation.

RECONSTRUCTION

Having in mind the fragility of many of the fragments and the probable difficulty of fixing them firmly in the reconstructed helmet, and in the extreme desirability that this should be of such a form that a normal head might have entered it, it was decided to model a head in plaster upon which the fragments might be mounted. I therefore modelled, directly in plaster, a head of normal size, i.e. about $23\frac{1}{2}$ inches in circumference at brow level (front to back 9 inches, maximum width $7\frac{1}{4}$ inches). Then I padded the head out above the brows to allow for the thickness of the lining which a metal helmet would naturally require. According to the thickness of each fragment I either stuck it in position temporarily with plasticine, or, if it was too thick at the back to line up well I cut spaces for it in the plaster padding of the head before fixing it. When finally arranged I fixed the fragments with strong white plaster. Any gaps were filled in with white plaster. Finally, every trace of the white plaster was covered with plaster mixed with brown umber. The helmet as reconstructed measures $26\frac{1}{2}$ inches in circumference just above the brows. The curve of the crown rises a little more than an inch above the top of the skull. The crest with its gilded mouldings on either side measures about $1\frac{1}{8}$ inch at front and back. This leaves about $12\frac{1}{2}$ or $12\frac{1}{4}$ inches available for the row of ornamented and figure panels on either side.

The helmet is of the Vendel type. Many of its details are similar to those helmets found in shipgraves at Vendel and Valsgårde in the province of Uppland, Sweden. The helmet dates from the sixth century. Its visor, embellished with gilded nose and mouth, is unique.

To Dr H. J. Plenderleith, Dr A. A. Moss and my other colleagues at the British Museum I tender my grateful thanks for their ready help in the many problems which arose during the reconstruction of the helmet.

In conclusion it may be observed that though the colour of the reconstructed helmet is generally mineralized and drab, like all ironwork from such sources, yet we have to imagine it in its original condition as an object of burnished silvery metal, set in a trellis-work of gold, surmounted by a crest of massive silver, and embellished with gilded ornaments, garnets and niello—in its way a magnificent thing and one of the outstanding masterpieces of barbaric art.

Herodotus on Min

(A reinterpretation of Book II, 4; 99; and 145/6)

by ELISE J. BAUMGARTEL

HERODOTUS'S history which includes his description of the country and people of Egypt has lost nothing of its charm and interest though nearly two and a half millennia have elapsed since it was first published. As the report of an eyewitness who saw the great pagan temples still open, and met a priesthood still educated in the remnants of a great tradition serving their gods in the ancient ways, Herodotus's account has held its place among the sources of Egyptian history. Though modern scholarship has shown some of his statements to be erroneous because based on untrustworthy sources such as popular legends and stories made up by interpreters and guides, Herodotus's veracity as an author has become more and more recognised and he can be relied upon to repeat faithfully what was told to him.

The purpose of this paper is to discuss Herodotus's account of the earliest history of Egypt. It will try to establish what actually was told to him by the priests of the Ptah Temple at Memphis, the Sun Temple at Heliopolis, and the Amon Temple at Thebes whom he quotes as his authorities. It also will make an attempt to fit in Herodotus's tale with what we otherwise know about the foundation of the united kingdom of Upper and Lower Egypt, and the first king of the first dynasty who founded it.

The three passages with which we are concerned are from book II, 4; 99; and 145/6.

The first in chapter 4 is a sentence wedged in between an account of the religious beliefs of the earliest Egyptians, stating that they were the first to speak of the twelve gods, the first to assign altars, images, and temples to the gods, and the first to carve figures in stone; and a description of the physical geography of the country. The passage referred to says that the human king who reigned over Egypt at the very beginning was Min. This sentence is irrelevant to what precedes and to what follows.

The second passage, from chapter 99, is the beginning of a history of the kings of Egypt. Herodotus begins with the earliest king of Egypt, but we are not told whether the first human king is meant or the first of the dynasties of the gods who preceded him. The name is equally given as Min. To him the foundation of Memphis is attributed. The king constructed a dam in the swamps which formed the country from Memphis to the coast of the Mediterranean and built the city on the newly won territory.

Before he embarks on both these passages Herodotus asserts that they are based on the statements of Egyptian priests. In order to test the truth of their stories he enquired of priests of different towns, Memphis, Heliopolis, and Thebes, and made notes of what was affirmed by all in common. Yet as he spent most of his time in Egypt at Memphis it is probable that the majority of his sources represent Memphis tradition.

In chapter 145/6 Herodotus discusses the relationship between Egyptian and Greek gods. He is convinced that the Greeks received their gods from Egypt, but seems somewhat disturbed by the relative ages the two peoples ascribe to what he thinks are the same gods. For whilst among the Greeks Heracles, Dionysos and Pan, are thought to

be the youngest gods in Egypt, Pan is the oldest of them all being the first of the first dynasty of the gods. This passage is interesting in two respects. First, it does not correspond with the usual hierarchy of the Egyptian gods as we know it from Heliopolis or Thebes or even Memphis. We may have here a version from Memphis which has escaped us. Secondly, and this concerns us specially, Pan is the name given by the Greeks to the Egyptian god Min, and Min is the name mentioned in the two passages quoted above.

The name which we usually ascribed to the founder of the Egyptian kingship is Menes. This name is supposed to go back to Manetho who wrote a history of Egypt under the Ptolemies which is lost to us. Eratosthenes and other writers, however, still knew it, and copied out parts of it in their own writings. As a source for the correct form of a name it can scarcely stand up against Herodotus to whom the name was given by an Egyptian priest centuries before Manetho. Modern editors of Herodotus make light of this difference in name. Wiedemann (1) says that Herodotus perhaps wanted the name to resemble that of 'Minos'. More recently Waddell (2) comments 'Min, generally known as Menes'. Nobody seems to have noticed the coincidence between chapters 4, 99, and chapter 146, namely that the same name is given to the first god king and the first human king who reigned over Egypt at the very beginning. This coincidence makes it doubtful, to say the least, whether the priests meant a human king when they told Herodotus about the beginning of the first dynasty and the foundation of Memphis, the more so as we find the word 'human' attached to Min only in chapter 4, where the sentence about him did not seem to belong to the text which preceded nor to that which follows.

If we now compare with Herodotus's tale recent knowledge acquired through excavations in Egypt, chiefly those of Flinders Petrie at Abydos and of Emery at Saqqāra, we find our doubts about a human king 'Menes' even more justified.

The identity of king Menes has long been a matter of controversy. Though we have a fairly complete series of royal tombs of the first dynasty, that of the most famous of them, Menes, remains undiscovered. The honour of having been Menes is disputed between two kings, Hor-Aḥa, whose tomb was recently excavated at Saqqāra, and Nar-Mer, whose famous slate palette was found in the temple of Hierakonpolis. These kings are called followers of the god Horus. Menes is not the Horus name of either of these kings, and it is assumed that it might have been the *nebty* name (each Pharaoh assumes several names when he ascends the throne) of one of them. The draught board, the hieroglyph for *mn*, has been found in conjunction with both these kings' names, but whether it stands for a name, or a title, or something else cannot be proved. The few examples of the *mn*-sign on First Dynasty objects have been recently collected by Emery in his publication of the tomb of *Hor-Aḥa*, pp. 4 ff. (Professor Battiscombe Gunn kindly drew my attention to the fact that the jar-sealing showing Nar-Mer's *sereḥ* [the formal palace façade on which the king's name was inscribed] alternating with the *mn* sign [Emery's fig. 1] is probably a restoration of Petrie, *Royal Tombs*, II, pl. 13, 9. There is no reference to it in the text). He comes to the conclusion that the *mn* sign is probably a title where it appears between the *sereḥ*s, but a personal name on the ivory from the tomb of Mer-Neith at Nakāda, where it is enclosed in a sort of pavilion underneath the *nebty* title. If the *mn* is a title in the one case, which seems probable from its position between the *sereḥ*s, it is most likely a title also in the pavilion, where it is

¹ Alfred Wiedemann, *Herodotus, zweites Buch*. 1890, p. 394.

² W. G. Waddell, *Herodotus, Book II*, p. 211, 4.

associated with the *nebtj*-sign. Its position there goes far to show that it was a royal title. If so, what might be its meaning? It might be either a participle of the verb *mn* perhaps translatable as the 'established one', or the name of the god Min in a title similar to the Horus and the *nebtj* title. We do not know of a royal title in Egypt in the form of a participle, but a royal title in the form of a divine name is regular Egyptian usage. Can we then assume that the name of the god Min was used as a title by the two first kings of the First Dynasty in a way similar to the use of the name of the god Seth by the kings Peribsen and Khasekhemui, or the use of the name of the god Horus? This does not seem impossible, though there are some difficulties to overcome. First, there is the extreme rarity of the *mn*-title as compared with the other royal titles, then the spelling of the name Min. It is generally written with the emblem of the god; only once in the Pyramid Texts is the full spelling given (3). This shows that the name could be written phonetically and without the usual symbol. The name of Min does not occur with certainty on any of the tombstones from the Royal Tombs at Abydos, with one possible exception, where the name is spelt m-n (4). But these are the tombstones of the courtiers of the 'living Horus', and one should not expect names combined with Min there. Horus was a late god compared with him. Could it be that Min was the title of an older Lower Egyptian kingship residing at or near Memphis, and that Herodotus's stories of Min and Pan convey just a distorted echo of the historical facts?

No mention of King Menes has been preserved between these early documents—if we can take them as such—and the Abydos list and the Turin papyrus. In them Meni (5) opens the series of the kings of Egypt. These documents are distant enough in time from the age of the archaic kings to make it understandable that either the god who was thought of as being the first divine king of Egypt and king of the gods was put at the beginning of the human sequence also, or that the title of *mn*, out of use for centuries, was taken for a royal name. The fact that Min was so closely connected with the kingship makes this view not unlikely. A statue of Meni is at the head of the procession of the king's predecessor's carried before Min at the occasion of Min's greatest festival (6) as represented in the Ramesseum (under Ramses II) and in *Medinet Habu* (Ramesses III). That Min was thought of as the uniter of the two kingdoms is confirmed by Egyptian tradition. A Ptolemaic text speaks of Min uniting the two kingdoms at Memphis. Kees is of opinion that this text is based on a very old tradition. In fact the Pyramid texts express similar ideas, when they address the dead king: 'Thou traversest thy Horus places, thou traversest thy Seth places like Min (1928, b-c), or 'the gods see thee like Min who reigns in the two *itrt* palaces', (256, a). That Min was the lord of the two *itrt*-palaces, which are the representative sanctuaries of Upper and Lower Egypt, has caused comment before. Kees thinks that Min has taken over this title from Horus, with whom Min tends to be identified from the Middle Kingdom onwards (7). It seems much more likely that Horus took the title from the older god at a time when he succeeded Min as the foremost champion of the kings.

In spite of this connexion with Lower Egypt and the unification of the two lands, Min remained the lord of Upper Egypt. In his non-ithyphallic form he wears the white

³ K. Sethe, *Dic Pyramidentexte*, 424b. This spelling is our authority for the reading of the god's name.

⁴ Petrie, *Royal Tombs II*, pl. 27, 107.

⁵ The vowel between the consonants m and n is not known, it could as well be Minn.

⁶ H. Gauthier, *Les Fêtes du Dieu Min*, pp. 204 ff.

⁷ H. Kees, *Die Schlangensteine u. ihre Beziehungen zu den Reichsheiligtümern*. Z.A.S. 57, p. 131.

crown in its archaic shape without the uraeus, as do the kings of the early dynasties (8). Min's connexion with the Egyptian kingship seemed to Sethe so strong and of such old standing ('he carries the "flail" symbol of sovereignty already on an archaic sherd, Berlin no. 15454') that he thought it explicable only if Min was once the god of a capital and of the whole land (9). In order to make this possible Sethe assumes a kingdom of Koptos which he places in time between his supposed kingdoms of Heliopolis and Hierakonpolis. Sethe's idea that the Egyptians united their kingdom three times in the prehistoric period has always seemed somewhat strange, the more so as the Egyptians themselves do not seem to have remembered anything of it. A probable explanation is that Min who was one of the oldest gods of Egypt may have been connected with Memphis and its neighbourhood (10) at a very early date, and stood in a relationship to the earliest kings of Egypt similar to that between them and Horus. Our ideas of Egyptian religion are so closely centred around the Osiris-Horus-Seth stories that we have difficulty in seeing the rest of the Egyptian pantheon in the right perspective. We know very little about Egyptian religion in late pre- and proto-historic times. From the frequency of the Min emblem, and the scarcity of the Horus falcon on the boats of the red-painted prehistoric Egyptian pottery, we may deduce that Min was of greater importance than Horus who only slowly came into his own.

The myth that once was attached to Min is lost to us, but we know that he was a fertility god closely connected with a bull, he may even have been a bull himself originally. His epithets are 'the strong bull' and the 'bull of his mother'; the emblem in front of his archaic chapel is a pair of bull's horns. He is represented as a white bull at his main festival at Thebes, bull's horns crown his bearded effigy in the shrine on a Roman stela from Koptos the place of Min's chief temple. Some of this can be said about the Egyptian king also. He is represented as a bull on archaic slate palettes, a bull's tail is fastened to his kilt on formal occasions. It is not unlikely, if we follow Seligman and Murray, that the king's virility was as essential as Min's for the fertility of men, beasts, and fields of Egypt. The crown usually worn by Min is of the same type as the Red Crown of Lower Egypt which shows King Sesotris I of the XIIth Dynasty 2000-1788 B.C. as he dances before Min. It has the same stiff body which covers the hair completely, the same flat, slightly flared top, and the notches for the ears. The added decorations only differ, instead of the high feathers worn by gods only and the long ribbon, the royal crown has a rod and a long wire ending in a spiral, emblems peculiar to the lower Egyptian kingship. A similar wire occurs only in one other place in Egypt, namely, on the column between the bull's horns in front of Min's chapel. The resemblance between the crown of Min and that of Lower Egypt can hardly be due to chance. On the Sesotris relief from Koptos the king is wearing the Red Crown and the god its counterpart. On the Amenemhet relief found in the same excavation (11) the king is represented with the White Crown and the god is wearing a diadem similar to that of the Horus falcon of Hierakonpolis. Nor can it be an accident that on the relief from the Step Pyramid representing King Djoser with the Red Crown he is supposed to stay at Letopolis, the city written with the symbol of Min. If we now remember that the

⁸ A. M. Calverley. *The Temple of King Sethos at Abydos*, III, pl. 14.

⁹ K. Sethe, *Urgeschichte*, p. 168.

¹⁰ This assumption is strengthened by the fact that the name of Letopolis near Memphis is written with the symbol of Min. This town plays an important part in the ceremonies of the pharaoh's coronation.

¹¹ Petrie, Koptos, pl. 9.

oldest occurrence of the Red Crown is on a prehistoric sherd found in a tomb at Naḳada (12) we have to reckon with the possibility that the Red Crown, symbol of the Lower Egyptian kingship, is of Upper Egyptian origin or, more precisely, comes from Koptos and its neighbourhood.

But it is not only manifest from his crown that the god of Koptos had close connexions with Lower Egypt. He had a cult at Memphis, probably from a very early age, and even seems to have counted among the Memphite gods, for in the Sethos temple at Abydos he shares a chapel with them (13). Whether he had a temple of his own at Memphis is not known, and could only be ascertained by excavation. Min was a special favourite with the Old Kingdom pharaohs residing in Memphis. Those of the Fourth and Fifth Dynasties named sons after him, and made them his high priests. His high festival, the Min (procession of Min), frequently occurs among those mentioned in the tombs of Sakḳara. Though this festival is not called by this name before the end of the Third or the beginning of the Fourth Dynasty it cannot be doubted that its origin lies much farther back; it even 'merges with the first appearance of the Egyptian Monarchy', says Gauthier (14), who has made a special study of Min's festivals. He goes on to show that the feast of the 'birth of Min' (*mswt Mnw*) mentioned on the Palermo Stone as occurring during the reign of a king of the First Dynasty is the same as that called the procession of Min later on.

It seems of considerable interest that Min, a god at home in Upper Egypt, is found to have a very close and early connexion with Memphis, one which seems to go back to the foundation of the capital. This cannot be said of any other Egyptian god, and yet we should have expected it of one. Is it not strange that a king Menes of Upper Egypt, who styled himself 'follower of Horus' and believed himself to be 'the living Horus', should found Memphis in territory he had just conquered under the auspices of Horus, and then dedicate outside (not even inside) its walls its main temple to Ptaḥ? And yet that is the conclusion generally drawn from Herodotus's account though not even the name of Menes is found in his history. Ptaḥ is not mentioned on any of the royal seals or tombstones of the First and Second Dynasties nor in the Step Pyramid (15). His name occurs only three times in the Pyramid texts, and one of these is a repetition (16).

There is no indication of his existence on the Red Painted pottery of prehistoric Egypt. As far as I am aware he only occurs once in archaic times on a stone vase from a First Dynasty tomb at Tarkhan (17). Of his myth we know nothing, yet one outstanding document has come down to us written in his honour: the 'Monument of Memphite Theology'. Its last editor, Sethe, dates it back to the First Dynasty from the language and writing. It seems somewhat dangerous to me to assign the language and writing of a text to a period of which we have no contemporary documents other than short labels or names which we can only understand in part. But be that as it may the 'Monument' does not provide any clue to the connexions of Ptaḥ with 'Menes' and the archaic dynasties. If we are right in assuming that Min also was the god of Memphis

¹² G. Wainright, *J.E.A.* 9 (1923), p. 26.

¹³ H. Kees, *Die Schlangensteine und ihre Beziehungen zu den Reichsheiligtümern.* Z.A.S. 57, p. 131.

¹⁴ H. Gauthier, *Les Fêtes du Dieu Min*, p. 17.

¹⁵ The name written in ink on the sherd of an alabaster vase was found under the Pyramid. See B. Gunn, *Ann. du Service*, 28, pp. 167-8.

¹⁶ K. Sethe, *Die Pyramidentexte*, 560; 566; 1482.

¹⁷ Petrie and Wainright, *Tarkhan* 1, pl. 3, 1.

from the beginning of the dynasties and perhaps even before, things might become somewhat clearer. A god as a founder of a capital city would be much more in keeping with traditions concerning the foundations of other famous towns of antiquity than a human king. If the priests quoted by Herodotus were speaking of the god Min (and nobody has ever heard of a human king of that name) it would explain why he was of such importance at Memphis, why Min's festival is mentioned in the earliest Egyptian documents and most frequently in Saqqara, and finally that it is so closely connected with the coronation of the king. The 'procession' came to be considered as 'an incident in the king's life', it 'coincided with the king's coronation and with the yearly celebration in remembrance of the coronation' (18). This close connexion between the coronation of the Egyptian king and the festival of the god Min as yet unexplained, becomes clear if the one can be considered as a repetition of the coronation of the First Egyptian king, the god Min.

Some conclusions might be drawn if the suggestion brought forward on the reading of Herodotus's accounts of Egypt's earliest history should prove to be correct, namely that the god Min and no human king Menes was believed by the ancient Egyptians to be their first king and the uniter of the kingdoms of Upper and Lower Egypt, and that he was also held to be the founder of Memphis. First the controversy as to which of the historical kings Nar-Mer or Hor-Aha is identical with Menes would be settled; there would be no human king Menes. Thence it would follow that Memphis was older than the unification of the two kingdoms. It would seem probable that it was the capital of Lower Egypt before the conquest. Further, Emery's suggestion that Hor-Aha was then king who united Upper and Lower Egypt is strengthened, though the final pacification of the land may have taken some time after his death. Emery has pointed out that the special position of the Horus falcon on the *sereh* of Hor-Aha makes it likely that in his case Hor was part of his name and not a title as with his successors (19). 'Hor the fighter' would be a seeming name to be adopted by the first 'living Horus' who set out from Upper Egypt to conquer the kingdom of the Lower Egypt, and added to his White Crown the Red Crown of the followers of Min. We do not know whether already Aha took over together with the Red Crown the bull's tail and the coronation ceremonial which probably belonged to the conquered dynasty of Lower Egypt. Nar-Mer, who seems to have succeeded him, had himself represented on the famous palette from Hierakonpolis wearing the Red Crown and the bull's tail. With some luck Emery may excavate at Saqqara, where he is continuing his work interrupted by the war, the tombs of the Lower Egyptian kings who preceded Hor-Aha in Memphis and prove as correct a suggestion which can only be confirmed through further excavation.

¹⁸ H. Gauthier, *Les Fêtes du Dieu Min*, p. 286.

¹⁹ Emery, *The Tomb of Hor-Aha*, p. 21.

Notes and News

AN OLD CORNISH PLOUGH, AND OTHERS (PLATES V, VI)

IN *ANTIQUITY*, volume 8, 1934, a photograph of an old plough at Sleeve Farm, St. Ive, Liskeard, Cornwall, was reproduced. On page 204 some rather unfortunate remarks were made about this implement, the most notable being that it had some claim to be considered as an adaptation of the caschrom. These remarks had little justification in the photograph which plainly revealed that the implement was incomplete, that it was in fact only the landside half of a well-known type of plough stripped of its irons. Even one not acquainted with the detail of such implements should have noticed two fairly large holes bored through the plough-tail and realized that something was missing.

Recently Dr Eliot Curwen kindly gave me several photographs of this plough which he had taken the following year. Two of them, reproduced here by the courtesy of Dr Curwen, supply all the evidence needed to demonstrate exactly how much of the implement has disappeared.

PLATE V, A shows the side of the plough not visible in the photograph printed in *ANTIQUITY*. Owing to the angle that it makes with the camera it appears considerably fore-shortened, but the two holes bored through the plough-tail show up clearly. The purpose of these holes was to receive the two rough-staves, or spindles, which joined the (missing) furrow-side plough-tail to that shown in the photograph. In this kind of 'rectangular frame' plough, the furrow-side tail was of secondary importance. Its main function was to keep the mould-board out to its work, hence the somewhat flimsy method of attachment by two (or sometimes three) rough-staves. That there was a mould-board on this plough is made perfectly clear by the two nails or pegs just visible in the lower half of the foremost sheath (the sheaths are the vertical stretchers between sole and beam). The front end of the mould-board on this kind of plough is always nailed or pegged to the sheath, and the other end is similarly fastened to the foot of the furrow-side tail. It is clear therefore that the one side of the plough frame consisting of furrow-side tail and mould-board together with the two rough-staves is missing. Another missing fitting, of iron this time, is indicated by a bolt hole bored horizontally a few inches from the fore end of the plough-beam. The missing part is, of course, the hake or bridle which regulated the width of the furrow and to which the draught chain was attached.

PLATE V, B gives a view of the upper surface of the plough-beam and reveals how much else has been removed from this so-called 'primitive' implement. Two mortices cut vertically through the beam are seen here. The larger, a few inches in front of the foremost sheath, is, of course, that into which the missing coulter was wedged. The smaller, square, mortise, about halfway between the coulter-mortise and the fore-end of the beam was made to hold the plough-foot. The plough foot (M in PLATE VI, A) is a bent piece of iron or wood which acted as an adjustable skid and regulated the depth of the furrow. Finally, the former presence of a socketed plough-share is clearly indicated in both photographs by the wedge-shaped tip of the sole. To sum up, it is clear beyond any possibility of error that this plough is very incomplete, having lost its furrow-side tail, mould-board, two rough-staves, coulter, share, plough-foot and bridle.

ANTIQUITY

To connect this plough with the Breton implement in the Pitt-Rivers Museum, as was done in ANTIQUITY is to make a longer journey than is necessary or wise. The Sleeve Farm plough is in fact an example of a well-known British type once common over an area at least as great as from West Wales to Devon and Cornwall. In Cardiganshire it was called the Cardiganshire plough, in Devonshire the Devonshire plough, and in Cornwall the Cornish plough. The *General View of the Agriculture of the County of Cornwall*, by G. B. Worgan, published in 1815, gives a poor but recognizable illustration of the implement. Although the mould-board appears to be located on the wrong side of the implement the text explains that it is 'shaded lightly in the

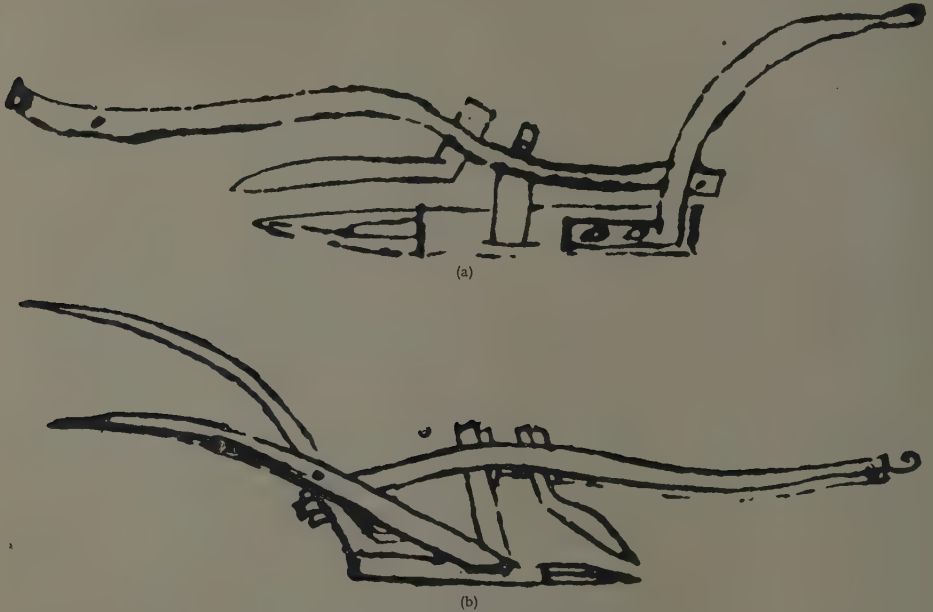


FIG. 1. (a) CARDIGANSHIRE PLOUGH, 15th century, from Llanstephan Ms 116, fo. 105
(b) CARDIGANSHIRE PLOUGH, 18th century, from National Library of Wales Addl. Ms 67 A, p. 192

By permission of the National Library of Wales

figure, to shew the construction of the other parts'. Worgan further says that the mould-board 'is made of a straight piece of wood', and that 'if a lay is to be broken up, the stripping or paring share, is used'. This share, a winged type, is illustrated separately on his plate VII. The share shown on the plough is the usual 18th century 'spear-point', commonly used on stony ground. Cornish practice was to turn a furrow 'from four to six inches in depth, and six or eight in breadth, laying it more or less on its edge, according to the crop intended to be sown'. As for the plough team, 'the draught is occasionally performed by four or six oxen in yoke, commonly with two oxen and two horses, and sometimes by two horses alone'.

Charles Vancouver who wrote the *General View* (1808) of the neighbouring county of Devon gives two illustrations of the same type of plough. The one I reproduce

(PLATE VI, A), in order to explain the construction gives a view of the landside half of the plough in addition to the complete implement. It also shows in front of the coulter a plough-foot (M) of the type once used on the Sleeve Farm plough. Marshall in his *Rural Economy of the West of England* (1796) gave a detailed description of this type of plough as found in Devonshire, but was apparently unaware how widely it was distributed.

The earliest record of this plough that I have come across is in the form of a small, rough but accurately detailed drawing on the upper margin of folio 105 of Llanstephan MS. 116 in the National Library of Wales. The manuscript, which contains a copy of the Welsh Laws, was written in the second half of the 15th century. Internal evidence makes it very probable that the scribe was a Cardiganshire man and there is reason to believe that he was connected with the parish of Llanwennog. The drawing heads a page dealing with the laws of tillage. I give an enlarged reproduction on p. 152 (FIG. 1, (a)).

Next in order of date is a drawing of another Cardiganshire implement in National Library of Wales Addl. MS. 67A, p. 192. This is the handiwork of Lewis Morris, the well-known Welsh poet and antiquary, and was drawn about 1750 or a little before. Morris, who among many other things was a practical farmer, calls this implement 'The Cardiganshire Plow', and one may thus infer that the type was not found in the

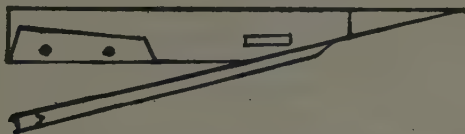


FIG. 2. PLAN OF SOLE AND MOULD-BOARD OF CARDIGANSHIRE PLOUGH
from National Library of Wales Addl. MS 67 A, p. 275.

writer's native Anglesey. In the drawing on p. 152 (FIG. 1, (b)) the characteristic foot of the main (landside) plough-tail is clear enough; but, partly because of the one-piece furrow-side-tail and mould-board, the two stout pegs that unite it to the sole of the plough are not visible. Luckily however, on page 275 of the MS. Morris draws the sole of the plough in plan and the horizontal foot with its two pegs clearly indicated by large dots is unmistakable (FIG. 2).

The National Museum of Wales has in its Folk Life Collection four ploughs of the same type. Three of these are of late 18th century date and come from Glamorganshire. One (PLATE VI, B), from Gelligaer, is in a perfect state of preservation and has an interesting curved wooden mould-board. A feature of this and some other Glamorganshire ploughs of the type is that the coulter is welded to the share, which for a winged share has an unusually long narrow point.

The remaining plough of this kind in the National Museum, from Tyddyn-du, Cribyn, Cardiganshire, is incomplete. It is most unusual in that the coulter tang is stamped with the dated initials 'D. L. 1821'. As the photograph (PLATE VI, C) shows, it has almost arrived at the stripped condition of the Cornish plough that occasioned this article. It has lost its furrow-side tail and mould-board and the lowermost of the two rough-staves that once held the tails apart. Of the ironwork, only the share is missing.

An examination of the implements figured reveals a certain amount of variety in detail; but only two of these variations (the winding mould-board and adjustable bridle

of the plough from Gelligaer) may be looked upon as improvements arrived at by stages through the passage of time. The earliest plough shown may seem 'primitive' in its lack of a second tail and mould-board; but it could be demonstrated from the drawing that here we have a deliberate rejection of these two features rather than evidence that they were unknown in the locality at the time. Independent confirmation of the latter alternative is not difficult to obtain. For example, the poet Lewis Glyn Cothi, a contemporary of our 'artist' and a native of a parish a dozen miles from his conjectured home, in a poem in praise of the plough gives a detailed description of the most 'developed' form of medieval wheel plough with mould-board, ground-wrest and two tails. The single tail is, of course, found far from Cardiganshire and at a very much later date. I. R. in his 1598 edition of Fitzherbert says: 'in Cambridge-shiere, Hunting-ton-shiere, Bedford-shiere and for the most part of Northampton-shiere, theyr Ploughes have but one hale' (1), and single tails are recorded for Cambridgeshire, Hertfordshire, and Essex in the 'General Views' of the agriculture of these counties compiled at the end of the 18th century. The fact is that certain plough parts were used or rejected contemporaneously over a very long period of time; instead of exhibiting a neat and orderly development, the plough remained as varied as function, soil, climate or other factors demanded. To quote Steensberg, 'Types widely different for various purposes have existed side by side through several thousands of years. Here again we see that the multiplicity of life is difficult to confine within the limits of a simple scheme' (2).

It is no part of my purpose in this article to point out the indications of 'various purposes' which even these specimens of the same plough type exhibit, or explain the different devices by which objects common to all were achieved. My reason for referring to them at all is to enter a reminder that ploughs are very much more complex implements than, let us say, axes and that they do not lend themselves to the kind of typological study and manipulation which can be of value in the case of a simple tool designed for a purpose that remains constant in circumstances of little variation. The important things to note here are the similarity of construction of the essentials of each plough-frame and the fact that this type was distributed over an area at least as large as south-west Wales, Glamorganshire, Devon and Cornwall.

It is necessary to say something about the form of the main (landside) plough-tail and the way in which it is secured to the sole. Seen as the stripped half of a plough which was mistaken for a complete implement, it is easy to see why it recalled the shape of a caschrom. It is, however, more than rash to suggest that this or any other type of plough developed from the caschrom. Most students of the subject, I believe, now think that any development was the other way round. At any rate, the great antiquity of the caschrom has yet to be demonstrated.

The reason for this forward-thrusting main tail seems to me to lie in the difficulty of securely uniting tail and sole in the old rectangular-frame ploughs. There was considerable strain at the point of union however achieved, and obviously the strongest plough-frame of the old type was that in which tail and sole were formed from a single piece of wood. Examples of such frames are the wheel plough illustrated in Cottonian MS. Tib. B.V. (pt. 1), fol. 3: a swing plough on folio 249 b of the Canterbury Psalter, another shown in a late 15th century wall painting in a Danish church (repro. *Acta Archaeologica*, VII, p. 272); and the Breton plough in the Pitt-Rivers Museum. Such

¹ *The Book of Husbandry*, Eng. Dial. Soc. reprint (1882), p. 128.

² Axel Steensberg: 'North West European Plough Types of Prehistoric Times and the Middle Ages', *Acta Archaeologica*, VII, p. 280.

suitably shaped pieces of wood must always have been difficult to find, and only two methods of uniting a separate tail and sole found favour with the makers of rectangular-frame ploughs. The one method was to tenon the tail perpendicularly into the rear of the plough sole, the other was that with which we are concerned here. The effect of the horizontal tail-foot strongly pegged at two points along the sole was to distribute the strain in a way that approximated to the ideal one-piece timber. Marshall, who was critical enough of the Devon plough, considered that 'in cases, where the old-fashioned soal is used, this is an admirable way of joining the handle to it; giving great strength and firmness of construction' (3).

F. G. PAYNE.

IMPLEMENTS AND THEIR WOODEN HANDLES (PLATE VII)

In the study of implement typology a consideration of the development of the vanished wooden parts may be just as important as that of the evolution of the part of the implement that has survived. The gradual change in form undergone by the stone or metal part of an implement as it develops may from time to time necessitate a more or less abrupt change in the method of hafting. This is illustrated by the development of the stone axe *via* the flat and flanged bronze axes into the palstave, for the methods of hafting a stone axe, on the one hand, and a flanged axe or a palstave, on the other, are inevitably quite different. Fortunately the occasional discovery of an original wooden handle gives us definite guidance at a few points; for the rest the reconstruction of the wooden parts must depend upon inference, controlled, if need be, by experiment.

Thus in the case of the stone axe we have the evidence of a hafted specimen found complete in Solway Moss that the axehead was inserted in a hole in the distal end of a somewhat club-shaped handle. The presumption is that at first the flat bronze axe, which was a translation of the stone axe into bronze, may have been hafted in the same way. On the other hand, the flanges of the flanged bronze axe and the palstave show that they, at any rate, cannot have been so mounted, but must have been inserted in a cleft in a probably natural side-branch projecting from the main handle. The change in the method of mounting must therefore have taken place in the stage of the flat bronze axe, and one may surmise that the reason for the change may have lain in the special tendency of the latter to split the haft on account of its being so much thinner than the stone axe. Even after this change in the method of hafting the continued tendency for the handle to split is indicated by the gradual development of the stop-ridge which converted the flanged axe into the palstave.

Similar and even more interesting problems of hafting are provided by a consideration of the development of the sickle. By way of experiment a display has been arranged in the museum of the Sussex Archaeological Society at Lewes to illustrate this (PLATE VII). A dozen characteristic types of sickles are shown, ranging from the earliest known specimens down to one belonging to the 19th century; in most cases these consist of life-size replicas, but all are provided with wooden handles. In a few cases these handles are copies of ancient handles that have survived, and these serve as guides; the 19th century specimen has its own original handle, but in all other cases the handles shown are based on inference.

³ *The Rural Economy of the West of England*, I, p. 124. By Marshall's day 'the old-fashioned soal' was rapidly disappearing from ploughs all over the country. The Rotherham plough had appeared before the middle of the 18th century and by bringing both tails up to the sheath had eliminated the sole altogether. The result was a light plough of great strength. Another result was to give early 19th century wooden ploughs and modern iron ploughs a form which in essentials is not unlike that of the sole-less crook ploughs of antiquity!

The series is admittedly condensed and at least one parallel line of development is not represented on account of lack of space. Simplification is desirable also if one is to avoid confusing the visitor. Thus many more sub-types might have been shown, especially of bronze sickles, following the classifications of Sir Cyril Fox (1), but even if space had been available these would only have confused the issue, and it has been thought best to keep the display to the bare outline tracing the origin of the British sickle.

In the accompanying photograph of the display (PLATE VII) the suggested order of development is indicated by large numerals; specimens not numbered are accessory.

No. 1 is a life-size copy in wood of the original bone handle of a composite flint sickle from the Natufian deposits in the Mount Carmel caves—one of the earliest sickles so far known. The flint teeth which are inserted into a groove in this handle are original specimens kindly presented by Professor Dorothy Garrod. The carving of the head on the handle is approximate rather than exact as it was only based on an illustration of the original.

No. 2 is a life-sized copy of the composite flint sickle with its original wooden handle found by Miss Caton-Thompson in a granary pit in the Fayum, Egypt (2). The handle is still straight, though made of wood instead of bone, and devoid of ornament. The flints in this specimen, as well as in Nos. 3, 4 and 6, are made from flakes of black flint from Brandon.

Though straight or slightly curved flint sickles found their way into Europe (3) their line of development seems to have come to an end before the time when they would have been translated into bronze—unless, indeed, they were in any way the forerunners of the straight bronze knife.

No. 3 is a life-sized copy of a composite flint sickle of curved or angular form found complete with its wooden handle at Kahun in Egypt (xiith dynasty) by Sir Flinders Petrie (4). It has three flint flakes set end to end, collectively forming a crescentic blade.

No. 4 is only a general model illustrating the type of curved composite flint sickle that has been found in southern Europe. It is hoped soon to replace this with a replica of the specimen found at Solferino near Lago di Garda in north Italy (5).

No. 5 is an original Scandinavian flint crescentic blade set in a hypothetical wooden handle. Between southern Europe and Scandinavia the composite flint sickle has given way to the crescentic blade; this change, which consisted in the amalgamation, as it were, of the separate elements of a composite flint crescent (such as is seen in No. 3) into a single-piece flint crescent, may have taken place in the Alpine regions where both composite sickles and proto-crescentic blades have been found.

Nos. 6 and 7. In the composite flint sickle the purpose of the wooden haft running round the back of the row of flint teeth was to hold them all together in place. This was no longer necessary when a single crescentic blade was used, as in No. 5, though there is evidence that in Scandinavia this kind of haft persisted for a considerable time. It ultimately came to be realized that it was only necessary to secure the end of the blade that was nearest to the handle, and for this we have two lines of evidence: (1) a change in the form of the blade (seen in Denmark and Holland, and also in Britain to the exclusion of true crescents), whereby one horn of the crescent becomes a kind of stubby

¹ *Proc. Prehist. Soc.*, v (1939), 335; *Arch. Cambrensis*, xcvi (1941), 136.

² ANTIQUITY, 1927, I, pl. vi f. p. 336.

³ ANTIQUITY, 1939, xiii, 348 and pl. iii following p. 344.

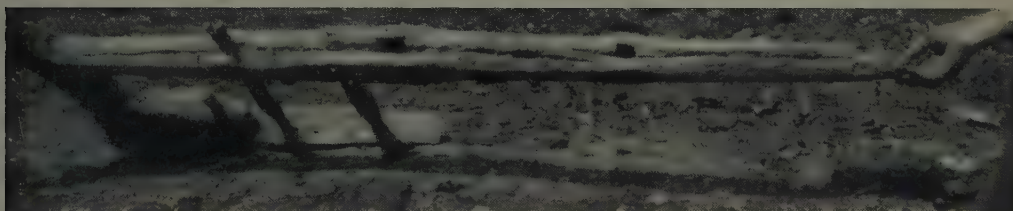
⁴ Petrie, *Kahun* (1891); *Tools and Weapons* (1917), pl. liv, 10.

⁵ ANTIQUITY, 1930, iv, 181, fig. 1.

PLATE V



(a)

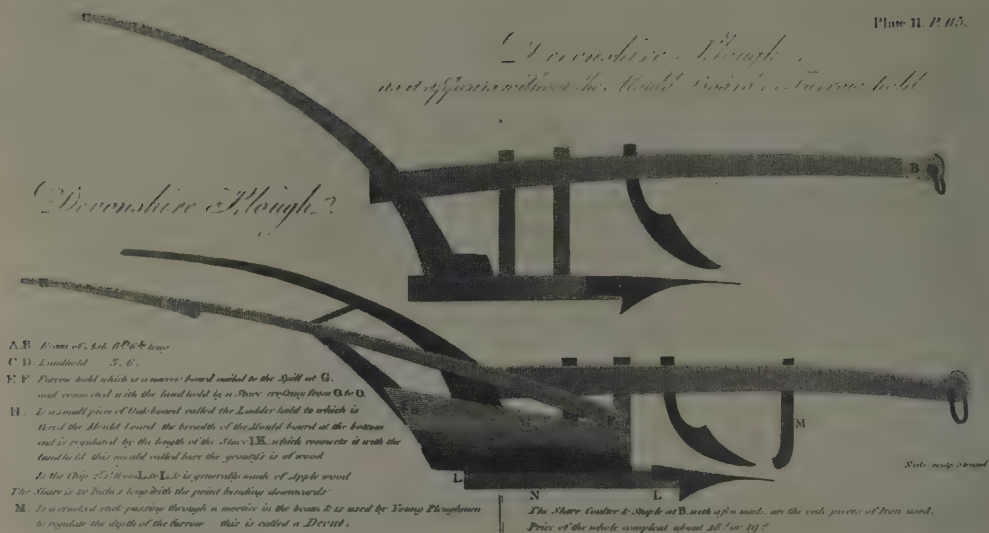


(b)

CORNISH PLOUGH, AT SLEEVE FARM, ST. IVE, LISKEARD
By permission of Dr Eliot Curwen

PLATE VI

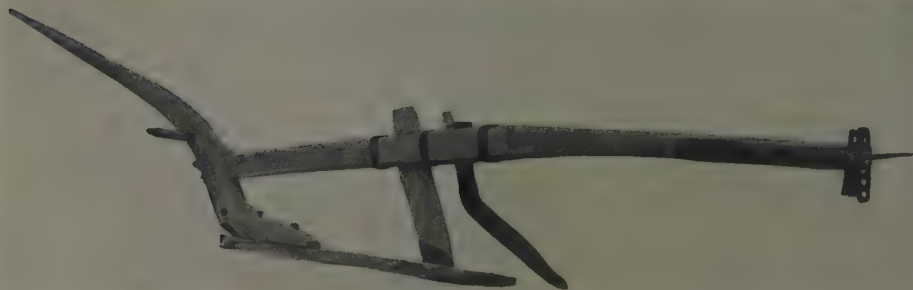
Plate VI. P. 113.



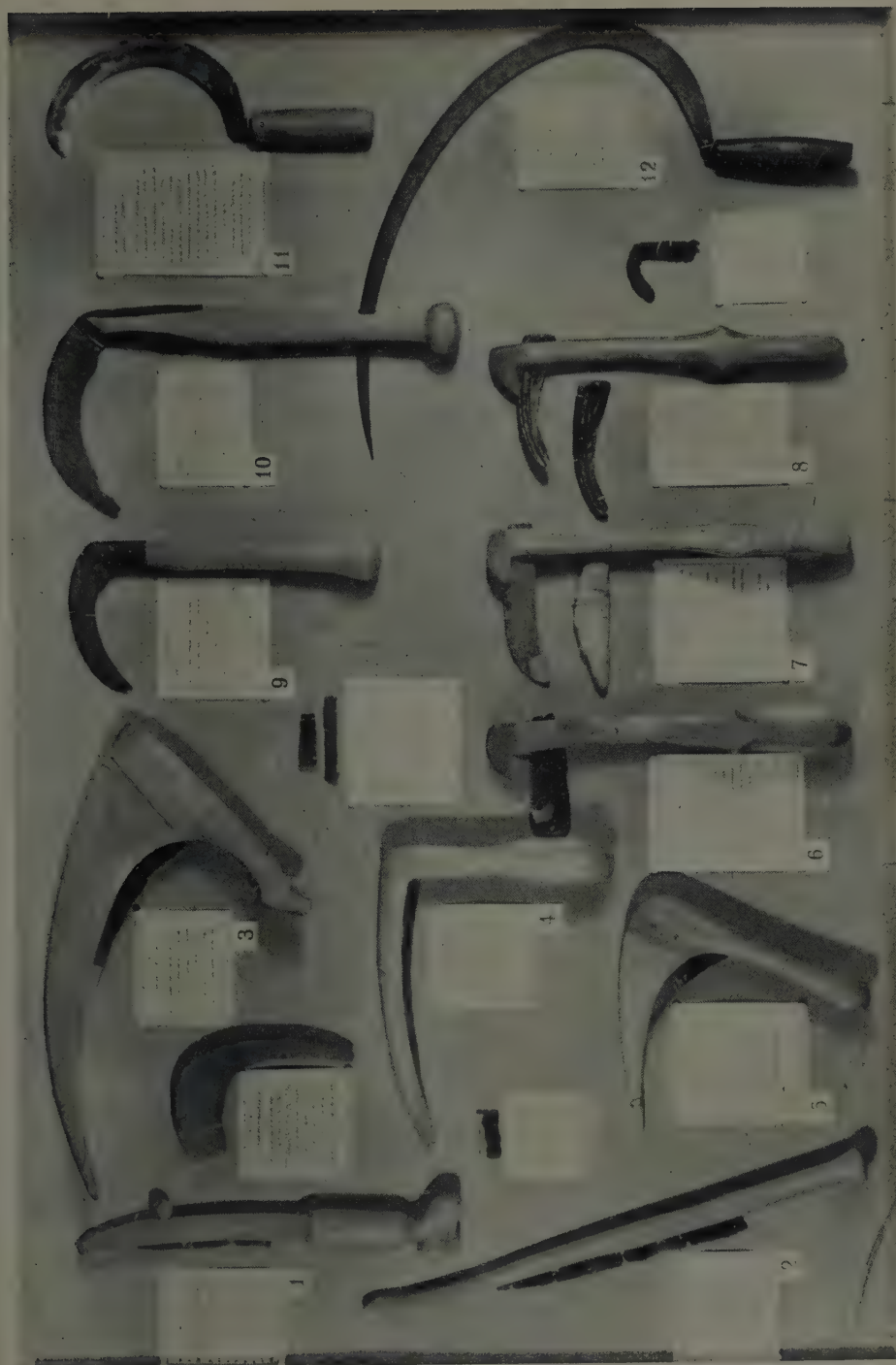
(a) DEVONSHIRE PLOUGH, from Charles Vancouver. *General View of the Agriculture of the County of Devon*, 1808



(b) GLAMORGANSHIRE PLOUGH, late 18th century. By permission of the National Museum of Wales

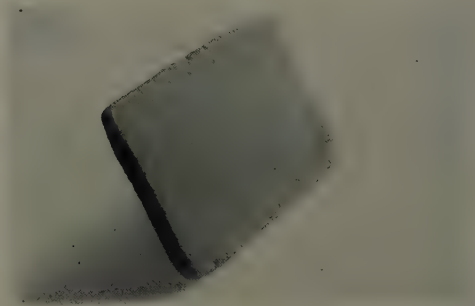
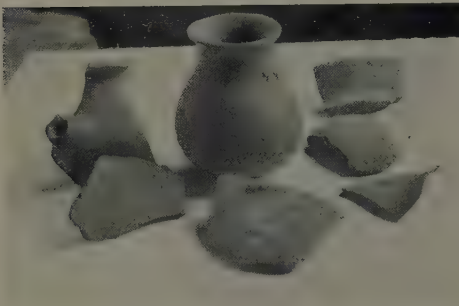
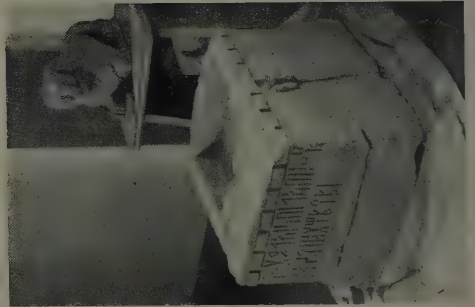
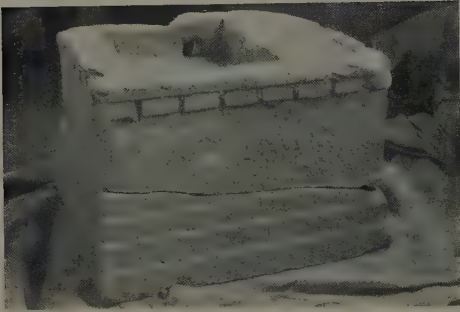
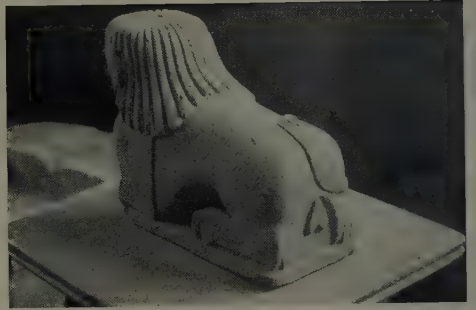


(c) CARDIGANSHIRE PLOUGH (incomplete), dated 1821. By permission of the National Museum of Wales



MODELS ILLUSTRATING THE DEVELOPMENT OF SICKLES AND THEIR HANDLES
(A display in the Museum of the Sussex Archaeological Society at Barbican House, Lewes)

PLATE VIII



SPHINX, ALTAR, POTTERY AND BRICK FROM GIRMATEN

tang; this is exemplified by No. 7, which is a cast of a flint blade of this kind found near Eastbourne (6); and (2) an original wooden handle suitable for holding this kind of blade, but actually holding a plain flint flake, found at Stenild in Jutland (7), a life-size copy of which is seen in No. 6.

Digressing for a moment: while the above line of development continued in Britain through the stages illustrated by Nos. 8, 9 and 10, giving rise to *angular* sickles, other lines of development, not represented here, started on the continent when bronze began to take the place of flint for these purposes. In Scandinavia the flint crescentic blades were in a few cases replaced by bronze crescentic blades set in an embracing wooden haft similar to No. 5; this was not, however, popular for long and died out, developing no further. Further south, perhaps in the Alps, the flint crescent, whether still composite or singlepiece, was also replaced by a bronze crescent, but here the wooden handle no longer embraced the blade but terminated at its proximal end; morphologically, however, the earlier embracive form of the handle is represented vestigially by two raised ribs which, starting one on either side of the end of the handle, converge and run together round the convex edge of the blade (8). This may have initiated the *semicircular* type of sickle found on the continent, and have been the prototype, first of the tanged iron sickle, and, through this, of the balanced iron sickle (Nos. 11 and 12) which was first introduced into Britain in the Roman period. Let us now return to the British series.

No. 8 is a cast of a knobbed bronze sickle from Edington Burtle in Somerset (9) which seems clearly to be a development in bronze of the flint type represented by No. 7. It seems equally clear that the method of hafting must have been similar, so a copy of the Stenild haft (No. 6) has been provided, and this seems satisfactory. This kind of knobbed bronze sickle is also found in Denmark, where it is dated to the period 1400-1000 B.C. (10). Swiss examples may be later, and Sir Cyril Fox in a recent paper (11) assigns a late date to the specimen from Edington Burtle.

No. 9 is a cast of a British bronze socketed sickle of rather developed type. According to Fox's typology (12) it was developed from one with an open tubular socket from the side of which the blade projected nearly at right angles. This must surely be the result of applying the principle of the socket to a blade such as we have seen in No. 8.

No. 10 is an original iron sickle from the Caburn (Sussex), of Iron Age date. The handle is based on an original sickle-handle found in the Somerset lake-villages. This implement is evidently a copy in iron of the type represented by No. 9, the wing-socket taking the place of the true socket owing to the technical differences between the working of iron and the casting of bronze.

Thus far our series seems to present a continuous development, although No. 7 is the first type to be at all certainly found in Britain. With No. 10 the direct line of development ceases. On the Continent, where socketed bronze sickles were not developed, iron sickles with wing-sockets were likewise not made. There the iron sickle belongs to the *semicircular* series, possibly developed from the Alpine bronze type

⁶ Curwen, *Arch. of Sussex* (1937), fig. 35, 1 (p. 145).

⁷ *ANTIQUITY*, 1938, XII, pl. II following p. 152.

⁸ *Proc. Prehist. Soc.*, IV (1938), p. 30, fig. 1, no. 3a.

⁹ Evans, *Ancient Bronze Implements*, fig. 233.

¹⁰ A. Steensberg, *Ancient Harvesting Implements* (Copenhagen, 1943), 76-7.

¹¹ *Arch. Cambr.*, XCVI (1941), 136.

¹² *Proc. Prehist. Soc.*, V (1939), 335.

described above, and it is provided with a tang which was riveted to the back of the handle. But all sickles, whether belonging to the angular or to the semicircular series, suffer from the disadvantage that they do not balance well in the hand, the point having a tendency to turn down towards the ground. In order to overcome this the *balanced* sickle was developed, either in the Alpine settlements or in Transylvania. In this the line of the handle passes through the centre of gravity of the implement, a result which is achieved by bending the tang back so that it forms something like a right angle with the first part of the blade. This new form can only have been derived from the tanged semi-circular type. The balanced iron sickle first appears in Britain during the Roman period.

As with the balanced sickle there is no longer any tendency for the implement to rotate in the hand, the tang is no longer riveted to the back of the wooden handle, but takes the form of a simple spike which is driven into the end of the handle.

No. 11 is a life-sized copy of a Roman balanced iron sickle from Silchester. The point of the blade must have originally been longer, as in its present form the implement does not balance (cf. No. 12).

No. 12 is a modern iron sickle from Sussex with its original handle.

The sickle thus provides a good example of the way in which wooden handles have to undergo modifications *pari passu* with the development of the 'business part' of the implement. The reconstruction of the wooden handles and other parts of querns has already been attempted in an earlier article (13).

In conclusion I have pleasure in acknowledging gratefully the help given by the following, whether by gifts, loans, or casts of specimens: the Visitors of the Ashmolean Museum, Oxford; the Trustees of the British Museum; the Director of the Eastbourne Museum; Professor Dorothy Garrod, F.S.A.; Mr H. St. George Gray, F.S.A.; and Mr W. A. Smallcombe.

E. CECIL CURWEN.

GIRMATEN—A NEW ARCHAEOLOGICAL SITE IN ERITREA (PLATE VIII)

The former Italian colony of Eritrea, subject since April 1941 to British Military Administration, has long been known for its remains of a civilization of classical times derived from South Arabia. Ruins of South Arabian settlements can be seen at Derca, on the Qohaito Plateau, at Tekonda, at Keskesse, near Metera and at Afuma, all in the south of the Akele Guzai province. Early English visitors to Annesley Bay—Annesley himself (Lord Valentia), Henry Salt and others—viewed and reported on the surface remains of the ancient port of Adulis at Zula on the northern boundary of Akele Guzai, and a certain amount of amateur excavation was carried out there by troops of the Napier Expedition to Magdala in 1867–68. A systematic excavation of part of Adulis, under the direction of Roberto Paribeni, was sponsored by the Italian Government in 1907 (1). Dr Enno Littmann gives a description of surface remains at some other Eritrean sites he visited in passing, with translations of a few inscriptions, in the account of his work at Aksum (2). But no excavation was ever allowed by the Italian Government elsewhere than at Adulis. The work of interpreting these Eritrean

¹³ ANTIQUITY, 1941, xv, 22.

¹ The finds were published in *Ricerche sul luogo dell'antica Adulis* (no. 3 of vol. xviii of *Accademia de' Lincei memoriali Monumenti antichi*), Rome 1908.

² *Deutsche Aksum-Expedition*, Berlin 1913. An account of the various Aksumite numismata is given by Arturo Anzani in *Numismatica Axumita* in the *Rivista Italiana di Numismatica*, Rome 1926.

archaeological records in the light of external history has been taken up by Prof. Carlo Conti Rossini (3) and Albert Kammerer (4).

Since large numbers of South Arabians must have migrated to Eritrea by the time Aksumite armies were able to establish their power astride the Red Sea from the Nile to the highlands of the Yemen—in the 4th century of the Christian era—it is not unreasonable to suppose that other sites may lie undetected beneath the surface and unmarked by the broken pillars, lengths of dressed stone walling and heaps of rubble that characterize most of those already known. Just such a site was in fact uncovered by Eritreans in January 1945 at Girmaten, in the district of Derichen, Akele Guzai Province. By the time the quite accidental discovery reached the knowledge of the military authorities, digging had been continued extensively by the curious villagers; they had made a rectangular hole twelve feet by ten in area and from one to five feet deep and had uncovered several movable objects. Further digging operations were at this juncture forbidden, village interest subsided, and the site was saved for the time being from further damage. The finds were removed from Girmaten and placed in the custody of the Government Museum in Asmara. So far as can be ascertained, nothing had been stolen from the site when digging stopped. The principal objects extracted from the hole—a stone sphinx and a small stone altar—are amongst the most interesting relics of antiquity that have yet come to light in Eritrea, and the purpose of this note is to place the discovery on record for experts qualified to interpret it.

1. *The Site.* Few elements remain from which to reconstruct the arrangement of the site; but, like most of the ruins in the Akele Guzai of which substantial portions are identifiable, it was certainly a place of worship. There is no trace of dwelling houses. Interest is focussed in the south east corner, which, as the excavation is cut into gently rising ground, is the deepest part. The south and east sides of the hole have each revealed a length of wall with the stones set in clay mortar. These pieces of wall presumably were not disjoined originally; but what remains of them now measures less than six feet long altogether and about three feet high. The walls represent the lowest level. The middle level contained the sphinx and its accompanying altar, which were found in the angle of the walls, but slightly above them and about three feet below the surface of the ground. The altar lay on its side, with the blood gully uppermost, and had been split vertically as it lay—that is to say, horizontally when righted. The sphinx also lay on its side, about foot from the altar, and had had its base so badly chipped that both front feet were broken off; the break was not recent. The right foot was fortunately uncovered some inches lower, where it had either acquired or retained a deeper red pigmentation in the different stratum of clay; the left foot has not been found. Near the opposite and shallower north west corner and at the highest level (from one to two feet below the surface) the Eritrean diggers found an earthenware beaker, six fragments of other pottery and a brick about 8 inches long, 6 inches wide and $\frac{3}{4}$ inches thick in the centre. Near the middle of the site there was an assortment of decaying sheep or goat bones.

2. *The Walls.* The facing of the fragments of wall had been torn away, revealing the conglomerate of mud and undressed stone which constitutes the greater part of the thickness of walls on most ancient sites in Eritrea, which are then faced with layers of squared stones. There is no trace of this stratified facing at Girmaten, but the rubble

³ *Storia d'Etiopia* 1, Milan 1928.

⁴ *Essai sur l'histoire antique d'Abyssinie*, Brussels 1926; and vol. 1 of *La Mer Rouge, l'Abyssinie et l'Arabie depuis l'Antiquité*, tome xvi of the *Mémoires de la Société Royale de Géographie d'Egypte*, Cairo 1929.

pulled away in the digging contained pieces of slate. Protruding slabs of slate are still used on some buildings in Eritrea instead of a gutter to prevent rainwater off the roof from running down the wall, whilst layers of slate can be seen at intervals in the walls of buildings excavated at Adulis, where they possibly serve some different architectural purpose.

3. *The Altar.* The altar measures $23\frac{3}{8}$ inches by $17\frac{1}{2}$ inches and is 16 inches high. It is carved from rock of a local type. The top is divided into two compartments, one $\frac{1}{4}$ inch deep and the other $2\frac{1}{2}$ inches deep. A small gully leads from the shallower to the deeper compartment, and another leads from the latter down the outside of the altar. The four sides are alike in having three receding steps at the base ($6\frac{3}{4}$ inches), above which rises the main perpendicular panel ($7\frac{1}{4}$ inches), the whole surmounted by a frieze and a cornice (2 inches). The general effect is of a squat pillar, but of a more decorated pattern than any of the pillars visible on other Eritrean sites. The inscription on the front panel reads :

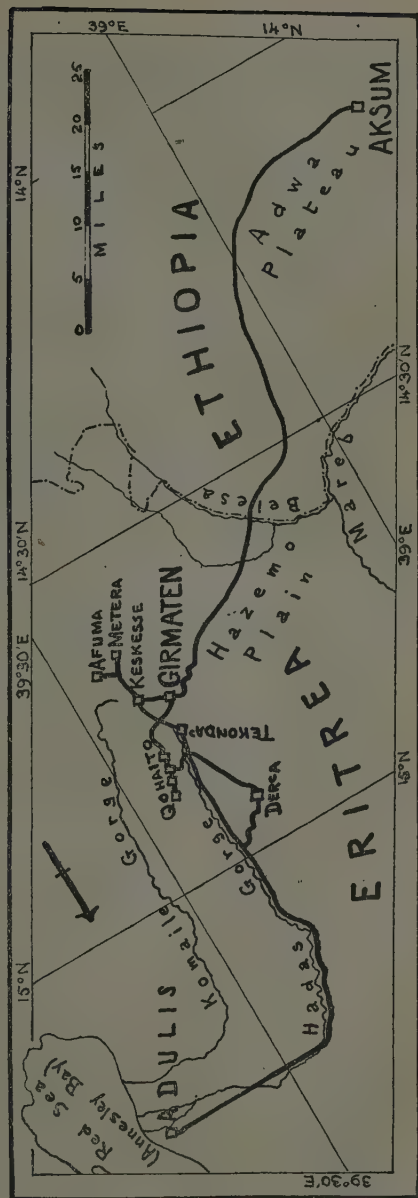
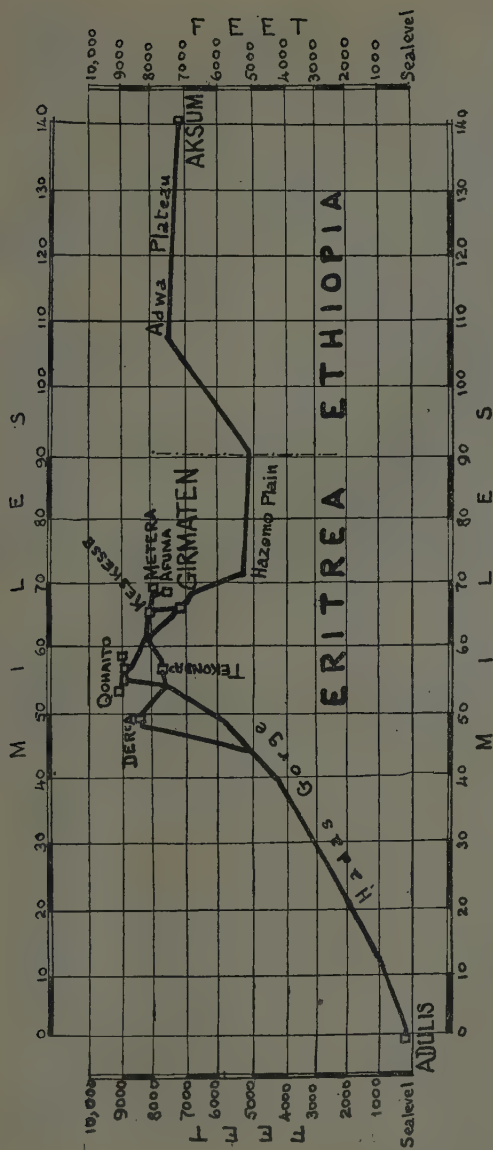
፲፱፻፳፯ ዓ.ም ጥቅምት ፳፭ ቀን

These letters are, of course, Sabaeen, and the arrangement is clearly *boustrophedon*. The top line reads from right to left, the second from left to right*. The letters are nearly 3 inches tall, about $\frac{3}{4}$ inch wide, and evenly and geometrically incised. But, like those of the inscription on one of the steles at Keskesse (5), they lack the ornamental ceriphs—suggestive of a rediscovery of cuneiform at some stage—which are a striking feature of the greater number of Sabaeen inscriptions found in Eritrea and at Aksum. From this it may perhaps be deduced that the Girmaten letters represent an earlier style.

4. *The Sphinx.* The sphinx is 13 inches long at the base, 6½ inches wide and 9½ inches high at the head. The hind quarters are those of a lion, but with a ram's (?) testicles; the head is human and has a double necklace of amulets. The hair is arranged in plaits that part from a circular crown on top of the head, which is flat, and are shaped in to the sides of the head, the neck and the back in what is perhaps a compromise between human hair and the lion's mane. The head is disproportionately large, but it looks as though the sculptor intended to emphasize it as being more important than the body, possibly because it alone constitutes the deity's individuality. Nevertheless the design suggests that, apart from the head, the sphinx is not an individual work, but one of a conventional pattern with well determined, practical features: the squared feet shaped exactly parallel to the flat rectangular base that holds the figure steady; the sheer sides and ends (the nose is directly over the front foot); and the motionless symmetry of the whole, varied only by the tail curled round to the partial suppression of the right

* We have submitted the transcription to Professor Sidney Smith, Keeper of the Department of Egyptian and Assyrian Antiquities in the British Museum, who translates it: '(A man called) *Hiḏhab*-El (or the like), the son of El-matī, has dedicated (this object) to Dhat Himyam'. He adds that 'some authorities do not regard matī here as a participle, but take it as a perfect and vocalise accordingly—wrongly as I think. They also say that Dhat Himyam is a solar goddess and means 'the lady of incandescence' or the like. I prefer the old view that Himyam must be a place-name'. We wish to thank Professor Sidney Smith for his help in this matter. ED.

⁵ Littmann, *op. cit.* no. 35.



haunch. Naturalism has been put into the treatment of the face, the draping of the hair and the detail of the protruding heel bones. The whole work has the finish of a highly developed sculptural tradition ; yet it seems the tradition was not completely emancipated from beginnings in relief sculpture, revealed in the imperfect detachment of the figure from its base, in the failure to distinguish the forelimbs from the flanks by more than a straight line and in the shallow carving of the heels and genitalia. Unlike the stone of the altar, that of the sphinx is not common on the Eritrean highlands. The letters on the broken foot are probably a later defacement ; they are G'iz (Ethiopic) for ' .WBR '.

5. *Other Movable Objects.* The beaker and the fragments of pottery present no obvious distinguishing features. They are all made of red clay, and only one seems to have been baked. One fragment has two letters roughly incised on it : ' en '. These could be badly formed Sabaeen ' MB ', but in all likelihood they are Greek. The flat brick is cambered on both sides and has the texture and ring of kiln baking.

The frequent Semitic aversion to sculpture seems to have prevailed in the Aksumite civilization. A few small blocks of stone carved with crude figures and inscribed with rough G'iz letters have been found (6), and two crouching lions are said to have been discovered carved on steles at Rora Laba in the north of Eritrea (7). But apart from these the Girmaten sphinx has the distinction of being the first piece of statuary to come to light either in Eritrea or from the ancient sites in northern Ethiopia : it is certainly the nearest approach to sculpture in the round yet discovered. This fact, taken with the doubt whether the stone is of Eritrean origin, provides grounds for the hypothesis that the small and easily transportable sphinx is not a work of local art. This hypothesis would not apply with the same justification to the altar which, though apparently unique in being so small and detached from any structure, is of local stone and inscribed in an alphabet used in other local inscriptions.

Studies of Eritrean antiquities have in the past tended to be overshadowed by those of Aksum itself. This is understandable, alike because Aksum played the dominant and so the more interesting rôle in the common history, and because the materials from which to reconstruct its vicissitudes are more accessible : abundant surface remains and the fruits of Littmann's systematic archaeological survey, besides a large volume of native Abyssinian historical tradition, in which none of the Eritrean sites has any place whatever. We do not even know with certainty the names of any of the sites, although it is generally assumed that Qohaito, the biggest—actually more extensive than either Adulis or Aksum—is the intermediate city along the road known to the third century Greeks as Koloë. Yet a glance at the map will show that the group of nine or ten settlements must have had a history of their own before Aksum rose to the paramouncy among the South Arabian colonies—through economic, social or military causes that are still obscure—and required to maintain communication with the seaport of Adulis. They are clustered within twenty miles of each other, geographically isolated from both Adulis and Aksum, but situated on both sides of the shortest and most practical route across the rugged country separating the major cities. The sites do not appear to be all contemporary, if we may judge from the incomplete evidence of surface remains alone. Thus Keskesse, whose foundation Prof. Conti Rossini has estimated to be as far back as the third or fourth century B.C. (8), has yielded an early Sabaeen inscription, but no architecture from the age of Hellenistic influence ; Tekonda has yielded later Sabaeen

⁶ Some can be seen in Asmara Museum.

⁷ According to Conti Rossini, *op. cit.*

⁸ *op. cit.*

inscriptions and Hellenistic architecture; Metera has yielded a pre-Christian rock tomb, together with the oldest Gi'iz text extant (9); Qohaito has yielded nothing essentially Sabaeen at all so far, but exhibits many examples of Hellenistic architecture and a single rock tomb inscribed with a big 'Maltese' cross. Until a 'school' can be fixed on likely to have produced the sphinx, it will not be easy to ascribe any date to the Girmaten site. However, it is obviously pre-Christian, and it may well prove to be at least as old as Keskesse, especially if the latter proves to be later than Prof. Conti Rossini's estimate. The apparently foreign origin of the sphinx suggests that it belongs to an early age when the South Arabian culture in Africa was still Asiatic in inspiration and before it acquired either the Hellenistic or the purely local characteristics discernible throughout the Aksumite period, from the third to the sixth century.

There is unfortunately equally little in the present finds from which to deduce in what relation Girmaten stood to its neighbouring sites, or to determine how long it continued to be inhabited. The site lies on the opposite side of a deep ravine from Tekonda—itself at the head of the Hadas Gorge—and at the beginning of one of the least difficult paths from the high plateau down to the Hazemo Plain, across which lies the shortest route from Adulis to Aksum illustrated on the accompanying map. This situation might tend to preserve a settlement from decay. On the other hand, the absence of dwellings may mean that Girmaten was never anything but a place of worship, possibly associated with the spring which emerges from a rocky cleft about a quarter of a mile away. The two almost certainly Greek letters on the fragment of pottery are in themselves slender evidence of continued occupation in the Hellenistic period; but there may be some corroboration in the chance discovery—not uncommon in that neighbourhood—in November 1945, near the path from Girmaten to Keskesse and about a mile from Girmaten, of a silver coin of Endybis (floruit circa 280 A.D.), the first Aksumite king known to have owned a mint of his own (10). That Girmaten should have survived into the age of essentially indigenous culture of the Aksumite (by that time Ethiopian) empire after the sixth century—the age that produced Dibdib, Bareknaha, Ham, Debre Damo and so on—seems unlikely without the confirmation of at least some object identifiable as early Christian and consequently later than 350 A.D.

D. J. DUNCANSON.

⁹ Littmann, *op. cit.* no. 34.

¹⁰ See Anzani, *op. cit.*

Reviews

STUDIES IN THIRD MILLENNIUM HISTORY. By T. BURTON BROWN. (*Luzac*, 1946). pp. 120, 3 plates, 9 figs. 10s 6d.

Archaeology is at last beginning to be given its place alongside literary studies as a means of acquiring a knowledge of Antiquity. Evidence of this is supplied by the gradual growth in the various universities of professorships devoted to this branch of learning. The most recent is the Chair of Western Asiatic Archaeology which has just been founded at London. Hence, the publication of Mr Burton Brown's collection of essays is opportune. The War prevented their publication earlier, and the inclusion of any later discoveries.

The book is small in size, but contains quantities of facts on a vast subject. The matter could only have been condensed into so inconsiderable a space by the careful economy of words in which it is expressed. This of course eases the reader's labour, as does the division into short sections each devoted to a collection of facts about a certain subject.

In covering such a range of material collected from so wide an area and in giving the discussion which is sometimes necessary, it is only too easy for the line of argument to get lost in a labyrinth of subordinate disquisitions. But this we are saved here, and even so the absorption of the information and its bearing on the problem is none too easy for anyone who has not made his study the general history of Near East.

Hitherto, very few of us have made more than an occasional excursion outside the archaeology of the special country in which each of us has worked. To attempt a synthesis of the results obtained in each of the countries and so to take a full and true view of the history of the Near East has hardly yet been begun. Indeed it is enough to daunt the bravest, and one of the merits of this book is that it makes the effort. Though only in its infancy the subject should, and no doubt will, become in itself a definite branch of archaeology.

Another merit of the book under consideration is that it consists almost entirely of facts collected together and classified, and then a short conclusion is added to each group of sections summarizing some simple results. Theorizing is absent. Full references are given for each fact quoted. This makes the book almost a classified index of the comparative archaeology of the Near East. For this alone it will always be valuable.

The area covered extends from Astrabad at the south eastern corner of the Caspian to the Aegean, and from southern Russia to Egypt. Hence, the archaeologist who has merely worked in one or other of the countries—in Egypt, in Mesopotamia, or in the Aegean as the case may be—is not in a position to discuss the book in all its bearings. He can only point out various things which happen to strike him as important or interesting. No doubt another reader would pitch on other points.

The present writer's own subject is Egypt, and the chapter about that country is fully satisfactory. The civilization of the Third Millennium is taken dynasty by dynasty and whatever evidence archaeology presents for each is collected into a series of sub-sections class by class, such as, writing, physical type, architecture, decorative motifs, stone vases, figurines, pottery, etc., etc. This is preceded by a short introduction shewing the reader what he may expect to find. Then, at the end of the chapter the implications

of the various groups of facts are collected in a short summary, and that is followed by half a page of simple conclusions. In this way the reader is enabled to appreciate the cumulative weight of the evidence.

The conclusion of the whole is that towards the close of the Third Millennium there was a large scale movement of peoples in western Asia. Evidence, whether archaeological or literary, for such movements has been accumulating for some time in the various countries of the Ancient World. In Mr Burton Brown's book we have quantities of the archaeological facts, backed by anything the literature has to impart, collected, not from one country only, but from the whole area and set out in convenient form. The evidence shews that the general movement came from the north or north east of the Near East. The movement shews no signs of having come from the central Anatolian plateau, which like the other lands discussed was a recipient of such movements. It seems to have come from somewhere east of that : possibly the hill country east of the Taurus including the Caucasus.

One piece of evidence for the influence exerted by the peoples east of the Taurus is provided by the analysis of the copper used even in Early Helladic times, which ended about 2000 B.C., or slightly later. The metal contains nickel and some arsenic, and so is very like that used in Mesopotamia. As an ore of such composition has not hitherto been located in the Greek area, it seems certain that the Early Helladic copper came from some source which was equally accessible from Mesopotamia.

In ANTIQUITY, xviii, pp. 57-64, the reviewer recently brought evidence for traffic with the Far West at about 2000 B.C. from North Syria or Mesopotamia. It was sea-borne, coming *via* Cyprus and Crete and reached at least as far as Cythera. It seems likely that it had to do with the tin mining which at this time was beginning near Delphi in Phocis. This seems to support Mr Burton Brown's suggestion of another possible connexion between the East and West. Phocis was the centre for the 'Minyan' ware which has always been so enigmatic. Now it transpires that 'Minyan' ware is also found at Nineveh. As the author points out that it can hardly have reached Greece from Anatolia, can it be that the technique of making it was brought by these same sea-farers?

In Egypt there is striking evidence of foreign influence in the plans of the great rock-hewn tombs at Qau and of Hap-zefi at Asyut. These tombs are unique in Egypt and very rare elsewhere in the Near East. One, however, is known in Crete, another in Armenia, and a third at Ras Shamra possibly of later date. The foreign relationships of these Egyptian tombs are emphasized by the patterns with which they are painted, which are new to the country and always rare. They include what is now known as the 'Greek' square fret, and the double pairs of volutes with a palmette in the middle of each pair. With the palmette reduced to a stick this motif forms one of the patterns on a kilt worn by a Keftiu in the 18th Dynasty, and may often be seen today in the modern *kelims*. The present writer has brought evidence that Keftiu lay in Cilicia, and since then excavation has shewn that it reached round the Gulf of Issus as far as Ras Shamra. It is interesting, therefore, that a dealer should have stated of a *kelim* bearing the double pair of volutes that it came from Karaman, for that is the southern coast of Asia Minor.

Mr Burton Brown discusses the finds in Stratum IV at Nineveh and seeks parallels in Mesopotamia and elsewhere. He is led to conclude that this period came to an end about 2500 B.C. and draws up a table of the comparative chronology for Nineveh and other Mesopotamian sites and Egypt. The Mesopotamian dates differ from those generally current, but it is not for the present writer to prophesy which will finally prove acceptable. The Egyptian material at any rate is not in doubt, nor are the Egyptian dates to any extent that matters.

ANTIQUITY

It is always upon Egyptian evidence that schemes of chronology depend, and so the account of the Egyptian calendar is especially to be valued. Here the essentials of a subject, which students have made so complicated, are set out shortly and lucidly, and, for anyone who needs them, the footnote gives the references to the various discussions of the subject. After stating Meyer's scheme which was the beginning of any reasoned study of the question, the author, like everyone else, rejects it and also the strange illusion that the introduction of the calendar had to do with the accession of Menes. As is regularly done now, he adopts the year 2781 B.C. as the date of the momentous introduction. Even under Meyer's system this works out to be not far from the time of the Third Dynasty, to which Zoser belongs, and it was under Zoser that that universal genius, Imhotep, was at work. This conjunction seems to put the date beyond reasonable doubt. Hence, a firm date for the Third Dynasty has been secured and is generally accepted, as well as a firm point of departure for estimating other dates.

In contrast to the general security of the Egyptian dates, the insecure condition in which those of other countries are is illustrated by that given to the Age of Khammurabi. Not so long ago its beginning was put at about 2000 B.C. or even before. But since then evidence from Alalakh has shewn that it must be brought down to about 1894 B.C. This is of course outside the period discussed in this collection of essays, though presumably it will tend to bring down the dates of the preceding periods.

Finally, the essays are no doubt intended to form a basis of co-ordinated facts on which to build up other studies.

G. A. WAINWRIGHT.

THE CULTURES OF PREHISTORIC EGYPT. By ELISE J. BAUMGARTEL.

Published on behalf of the Griffith Institute by Oxford University Press, 1947. pp. xi and 122; 13 plates. £2 2s.

Dr Baumgartel and the Griffith Institute are both to be congratulated that this book conceived before the war when life was already difficult in the author's homeland and persevered with in England through the difficult times of Munich and the war itself, should see the light of day before conditions have returned to normal. Congratulations are also due to the author on the mastery she has obtained over the language of the country of her adoption, and to the publishers on the format and production of the book; we must presumably blame the times for the paper cover, since the book is obviously of sufficient permanent value to deserve a stiff one.

It is the result of wide reading and of original study of objects from excavations of predynastic sites, particularly those in University College, London, many of them hitherto unpublished. It is no fault of the author, but only of fate, which has confined her so much to work in museums and granted her so little opportunity to work in the field, that it suffers from being too much a composition of theory based on the museum objects within her ken. But for all that it is a valuable book which sheds new light on the Predynastic period.

The author begins by answering the question 'Was the birth place of Egyptian culture in the Nile delta'? with a satisfying negative, disposing of Sethe's hypothesis of a prehistoric Kingdom of Heliopolis; and then asks 'Where did Egyptian civilization originate'? And since the stone implements of the Upper Palaeolithic in North Africa, Egypt and Palestine are all flake and blade cultures, while the first predynastic culture (Nakada I) has a core industry, she concludes that the home of the founders of that culture cannot have been in the west, north or east and must have been in the south. She then reviews the earliest phases of Egyptian culture. There are indications that climatic conditions were very different when the earliest settlers came to Egypt, and

that the Nile Valley was unsuitable for their cattle. The Tasians settled on what are now low spurs of the desert, and there is no evidence of the inhabitation of Lower Egypt north of Asyut before Nakada II. The Nakada I people made their way west of the Nile valley and probably east of it, and the Fayum a culture belongs to them. They were in possession of grain and cattle both of Asiatic origin, and made pots without handles, some covered with red slip and burnished and some painted with white lines. They buried their dead in cemeteries.

Nakada II, she concludes, are the Asiatic people with whom Nakada I had trade relations and who invaded the Nile valley and set in motion the development which led to the historic Egyptian state. They used a blade flint industry, and their pottery, superior in every way to that of Nakada I, was painted in a different style. They were superior in metal working, and seem to have entered Egypt through the Wadi Hammamat, subsequently colonizing Lower Egypt.

In the second part of her book Dr Baumgartel surveys the foreign origins and connections of the Egyptian Predynastic. Frankfort has already demonstrated a connection between the pottery of Egypt and Iraq at the end of Nakada II. Our author now draws attention to the similarities between the painted pottery of Nakada I and II on the one hand and that of Western Asia on the other, similarities in shape as well as in technique and style. The parallels that she draws between the painted pottery of Egypt and of Iran and Iraq are both striking and convincing, and she suggests reasonably enough that Iran was the prototype from which Iraq and Egypt drew their inspiration. She further suggests, admittedly as a pure conjecture, that this culture reached Egypt *via* the ' Straits of Aden ' and followed the upper course of the Nile. On this I will comment in a moment. She draws other convincing parallels between the painted pottery of Nakada II and Jemdet Nasr.

She is not so satisfying in her treatment of the admittedly less known subject of the incised ware, which includes that generally known as ' herringbone ware '. She holds that the incised pottery of Egypt indicates that the culture of the Uruk period and the corresponding civilizations of Iran made their influence felt in Egypt. Here the similarity between the pot shapes seems to carry more conviction than that between the decorations. The herringbone design seems to be one that could have arisen in more than one locality independently.

She concludes her discussion of pottery with the suggestion that the black incised vessels of Nakada II indicate Egyptian relations with the south, and that the parallel between the rare rippled ware pots from Nakada and those found by the Griffiths at Faras is even more convincing evidence of those relations.

Her final paragraph on the stone vases of Egypt and Western Asia further support the view that there were connections between both areas during both Nakada I and II, and challenge some student to take up the petrological examination of the stone from which the vases were made, for such examination cannot fail to advance considerably our knowledge of the trade relations between the two areas.

The only original contribution that the present reviewer can make is based on the surface study of a number of early sites in the Sudan and the excavation of one of them at Khartoum. Sherds have been collected from the surface of many sites, but not a single painted sherd has so far come to light earlier than the Meroitic with the exception of one or two sherds that are probably Mycenaean. The earliest pottery seems to be a red brown ware, decorated externally with combing that could be ancestral to the Badarian, and with it is associated not a core industry but a variety of the Capsian and barbed bone spears that so far have their closest parallel in those found far away to the

west at Taferjit and Tamaya Mellet in the Sahara Nigérien. There they are associated with the arrowheads of the Nakada I culture which have not yet been found in the Anglo-Egyptian Sudan. Both in the Sudan and at Tamaya the makers of this culture were negroid; and in the Sudan they were hunters who neither cultivated nor owned domestic cattle, and they buried their dead not in cemeteries but in their settlements.

The culture that seems to follow next in the Sudan has a core industry with implements showing remarkable parallels not with Nakada I so much as with Fayum B. Its characteristic pottery is red, burnished, and decorated with an elaborate pattern of impressions, starting in a spiral at the base and clearly imitating basketwork. Climatic conditions were still wetter then than now, and it appears probable from sherds that have been brought in from the southern Libyan desert that impressed and incised pottery that imitates basketwork is common to the Saharan area, and indeed it may be found that its field stretches as far as North Africa and Spain. Little is yet known of the earliest pottery from Asia. It is by no means impossible that pottery was invented there and that it was a red ware decorated with comb impressions which spread into Africa across the Straits of Bab el Mandeb and so right across North Africa at a time when the area now desert was no bar to human communications.

It is probable that the earliest cultures of the Anglo-Egyptian Sudan and Nakada I, cover a very much longer period than has yet been realized. There seem to be several strains in the make-up of Nakada I; the core industry, the white line painted pottery, the barbed bone spears, etc., probably all have different origins, and only gradually in the course of a long development did they attain the synthesis of Nakada I.

The painted pottery certainly seems to have come from Asia, but it does not look as if it came *via* the Sudan, which probably did contribute both red incised, black incised and red-topped black wares and, it may be, even the rippled ware of Badari. We have many problems still to be cleared up in the south, and one is the relation of the rippled ware of the A Group to Badarian. A Group rippled ware has recently been found near Khartoum associated with black rippled ware sometimes incised as well, and with large brown pots decorated with an incised chessboard pattern. Dr Baumgartel on p. 25 suggests that Griffith's dating of the A Group rippled ware may not be right and that it may be contemporary with early Egyptian prehistory. Its similarity to Badarian is striking, but at Faras it was associated with imported articles that are protodynastic in date, and I am informed by Mr Guy Brunton that the rippled pots from Nakada now in the Ashmolean appear to be correctly placed late in Nakada II, so that at present it would seem that even if the Badarian technique had its origin in the south, that technique must have been there at least down to protodynastic times. But much work is needed in the Sudan before we can be content to say that that is the whole picture.

This is a book to be read and thought about by all who are interested in the problems of the origins of the Egyptian Predynastic, that fascinating period when our civilization was yet young; and the labour of producing it will have been well worth while if it inspires new field-work in localities likely to produce solutions for some of those problems.

A. J. ARKELL.